The Routledge Companion to Video Game Studies

Edited by Mark J. P. Wolf and Bernard Perron

THE ROUTLEDGE COMPANION TO VIDEO GAME STUDIES

The number of publications dealing with video game studies has exploded over the course of the last decade, but the field has produced few comprehensive reference works. *The Routledge Companion to Video Game Studies,* compiled by well-known video game scholars Mark J. P. Wolf and Bernard Perron, aims to address the ongoing theoretical and methodological development of game studies, providing students, scholars, and game designers with a definitive look at contemporary video game studies. Features include:

- new perspectives on video games both as art form and cultural phenomenon;
- explorations of the technical and creative dimensions of video games;
- accounts of the political, social, and cultural dynamics of video games;
- comprehensive and interdisciplinary models and approaches for analyzing video games.

Each essay provides a lively and succinct summary of its target area, quickly bringing the reader up-to-date on the pertinent issues surrounding each aspect of the field, including references for further reading. Together, they provide an overview of the present state of game studies that will undoubtedly prove invaluable to student, scholar, and designer alike.

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CONTENTS

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PREFACE

Over the past decade, we have had the pleasure of working with many of the major researchers in game studies, as well as with new and promising scholars coming from a wide range of disciplines, all of which has broadened and enriched our own perspectives regarding the field. Therefore, in *The Routledge Companion to Video Game Studies*, we have pursued a very productive collaboration in order to push the field's boundaries further, survey its wide and growing horizon, and to provide a unique, authoritative and multi-disciplinary overview.

The Routledge Companion to Video Game Studies addresses a series of themes pertinent to the ongoing theoretical and methodological development of game studies. While the number of publications in game studies has expanded greatly since 2000, and continues to grow, many anthologies and textbooks have, however, often studied video games from a limited number of theoretical perspectives, focusing for the most part on their formal and sociological aspects. Trying to remain true to the key issues, and the thinkers, texts, and approaches necessary to understanding video games, the *Companion* features essays on such topics as interactivity, ludology, narratology, fiction, education, sociology, media ecology, culture, research, and more. These essays survey—not without constructively debating about their outcomes—the general ways video games have been thought about and dealt with, giving a broad overview of the issues at hand.

We have also tried to propose new divisions or distributions of knowledge in order to enlighten study and stimulate analysis from new angles. For instance, gender studies generally talks about questions of femininity in video games, while men's roles are more typically overlooked and rarely dealt with (despite their overabundance, or perhaps because of it); thus "Femininity" and "Masculinity" are separate essays here. If multiplayer gaming by and large leads to the analysis of massively multiplayer online role-playing games (MMORPGs) and is opposed to the ways single-player games are played, studying the two experiences together sheds light on their similitude. The video game might well be considered the tenth art, yet we barely question how we talk about the game as an artifact. As video games are rule-based, the notion of "conventions" is as important to the game activity, and is rarely addressed directly. In the same manner, we have also examined the subject inductively, and instead of merely dealing with the classical opposition of play and game, separate inquiries into challenge, cheating, conflict, objectives, and repetition will certainly aid new and more in-depth accounts of the activity of playing games. Other topics, such as resolution, dimensionality, and worlds, present new ways of considering the artistic and technical aspects of games and their graphics and sound.

Overall, we have divided the *Companion* into seven broad parts, ranging from the material to the philosophical, into which our essays are organized. We begin with Technological Aspects, considering the machinery that makes games playable, and that underlie all games and systems. Formal Aspects are explored next, and these are concerned with design, graphics, and sound, and the way they are used in game structures. Moving up another level, Playfulness Aspects examines the experience of video gaming, the ways games are used, and what they have to offer players. The next part, Generic Aspects, looks at some of the popular genres of video games, and their connection to video games in general. From there we move out to Cultural Aspects, considering such topics as convergence, ecology, education, violence, and more. Closely linked to these are Sociological Aspects, which examine the way video games depict, engage, and influence human beings, both individually and in groups. Finally, Philosophical Aspects covers a broad range of topics including cognition, ideology, meaning, ethics, ontology, transcendence, and more.

Naturally, we realize that a single volume, substantial as it may be, can give only a sampling of the many topics and lenses through which video games can be considered and studied; and as time passes the field of game studies will grow broader and deeper, just as its object of study continues to expand and evolve, as games find new forms and venues and create new experiences for their users. It is our wish, then, that readers will find the *Companion* useful for its summaries of existing work in the field and for its variety of writing styles and essay structures—there are indeed many ways to write about video games and different methodological approaches. But above all, we hope that it will be a point of departure for the readers' journeys into the vast regions of inquiry that are hinted at in the essays but remain unexplored.

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Part I

TECHNOLOGICAL ASPECTS

1

ARTIFACT

Olli Sotamaa

The term “artifact” can refer to many different things. Common definitions describe an artifact as “something created by humans usually for a practical purpose; especially: an object remaining from a particular period” and “something characteristic of or resulting from a particular human institution, period, trend, or individual” (Merriam-Webster’s Online Dictionary, 2012). The word itself was coined in the early nineteenthth century and it comes from two Latin words: *arte* (from *ars*) that means “by skill” and *factum* that is the past participle of *facere*, to do or to make. All artifacts are characterized by this twin relationship between doing and making that is found in *facere*. Accordingly, “an artifact is anything that we can design in the very large sense of the word” (Friedman, 2007, p. 7), including both the artifacts of doing and the artifacts of making.

In his classic essay “Do Artifacts Have Politics?”, Langdon Winner contemplates two ways in which technological artifacts can embody specific forms of power and authority. He discusses both the “instances in which the invention, design, or arrangement of a specific technical device or system becomes a way of settling an issue in the affairs of a particular community” and the “man-made systems that appear to require or to be strongly compatible with particular kinds of political relationships” (Winner, 1986, p. 22). While video games surely partake of both categories, they at the same time question the stable ontological status of “man-made” objects and pose the question concerning artifactual agency (Giddings, 2005). The question arises, then: how do the general definitions help us understand games?

With their military origins, emergent and programmable nature, and ubiquitous popularity, video games provoke multiple scholarly approaches. The study of games as artifacts may be roughly characterized in three parts, each highlighting a different key aspect of contemporary video games. First, the history of video games highlights the importance of approaching video games as *material artifacts*. Second, studying video games as *software artifacts* sheds light on the very “digitality” of these games and highlights the role of procedural rules in the meaning-making process. Finally, games need to be examined as *cultural artifacts* that carry embedded meanings and ideas and are socially shaped in production and use. By introducing, evaluating, and integrating the aforementioned perspectives, this essay aims at teasing out the value of artifactual approach for the study of video games.

The Materiality of Video Games

In many ways, the known history of games is a history of artifacts. The current understanding of the origins of gaming is largely based on historical artifacts unearthed at archeological sites over the world. Earliest known dice, gameboards, and other ancient gaming equipment can shed light on the forms and nature of play even in preliterate societies. A closer look at recent video game exhibitions in museums indicates that also the history of video games is intimately tied to material manifestations of gaming. The major attractions of these exhibitions include arcade cabinets, early home consoles, and exotic gaming peripherals, in other words, material artifacts, the objects remaining from a particular period.

The historical perspective also nicely highlights how artifacts are not stable but change over time. For example, the game of chess has several origins. Its predecessors can be found in India, Persia, and East Asia. The game has existed in several different variations over the centuries, and the chess pieces we recognize today were designed only in medieval times to satisfy the European taste and to reflect the feudal social hierarchy of the time (Parlett, 1999, pp. 276–331). Similarly, the products of the modern video game industry have a potential to capture, archive, and communicate the cultural, social, and economic ideas and behaviors typical of particular periods and societies. One of the often-repeated anecdotes quintessential to video game culture is the story of the Atari cartridge burial. According to the story, Atari Corporation drove truckloads of merchandise, including several million unsold and returned cartridges of *E.T. The Extra-Terrestrial* (Atari, 1982) to a New Mexico landfill site in 1983 (Donovan, 2010, pp. 108–109). The burial made the *E.T.* game cartridge an iconic gaming artifact and a key symbol of the North American video game industry crash of the time.

At this point, someone who has been closely following the developments of the global game industry might point out how the recent industry trends accentuate virtualization, pervasiveness, transparency, and immateriality. And indeed, the buzz around virtual items, digital distribution of games, cloud-based gaming services, and controller-free interfaces seems to question the significance of hardware. In fact, sometimes it appears that setting players free from the chains of material artifacts has become a widely-shared industry dream. Interestingly, a closer look at contemporary game cultures still reveals a rich body of meanings attached to gaming hardware and other material manifestations of digital gaming.

In his study of PC case modding, Simon (2007) points out how the gaming experience is importantly connected to the material pleasures of embodied practice. Despite the mainstream information technology rhetorics that foreground the processes of immersion, dematerialization, and virtualization, gamers seem to find multiple ways of appreciating and celebrating the very machines that enable and facilitate their playful behaviors. According to Simon, case mods act both as representations of gamer identity and as “material instantiations or enhancements of the gaming experience” (2007, p. 188). In other words, the presence of customized gaming machines allows the gaming experience to continue even outside the immediate gaming instances. Similarly, we can find empirical data to show how game cabinets, cartridges, discs, boxes, and other related materials can operate as important carriers and mediators that provide games cultural value that surpasses the passing gaming instances (Toivonen & Sotamaa, 2011). Phenomena such as game collecting associate games with more general themes of identity, sociability, and history. Storing, organizing, and putting games on display can have an important role in creating a particular gamer identity, gathering subcultural capital to be communicated to other devoted enthusiasts, and ensuring the opportunity for reminiscing and recalling past gaming experiences.

The aforementioned studies concerning video games as physical artifacts can serve as a healthy reminder of how even today digital games should not be reduced to mere code lines running along electrical cables. In fact, a steady growth in popularity of exclusive collector's items, high-end gaming peripherals, and hybrid games and toys indicates that dematerialization is surely not the only trend defining the future of commercial video games. At the same time, is clear that the very "digitality" of video games deserves more attention. So in the following, I will elaborate more on the implications and consequences of making games out of code.

Games as Procedural Artifacts

A glance at the history of computers reveals that the difference between hardware and software is not clear-cut, but there is significant overlap between the two. For early hackers, responsible for the first video games, creating software was not possible without manipulating hardware. In the 1980s, fiddling and tinkering with computers was at least still as much about hardware as it was about software (Swalwell, 2012). All in all, the idea of having separate roles for a mechanic, a programmer, or a user is very recent, and according to Simon (2007, p. 179), a result of a conscious "counter-reformation" process in computer systems. Recognizing the complicated but necessary relation between the higher-level symbol functions (software coding) and material conditions such as voltage differences (hardware level) suggests that all software is and will also in the future be intimately tied to its material basis (Kittler, 1995; Parikka, 2012).

The emerging field of software studies accentuates the importance of conceiving software as a distinct theoretical category. It is argued that the wider cultural analysis of computational and networked media often lacks the profound understanding of how software functions and thereby directs its use and users (Fuller, 2008, pp. 2–3). From a games perspective, this agenda calls for more attention to the computational processes that essentially make video games function.

In order to explicate the expressive potential of software, Noah Wardrip-Fruin (2008) has invented the notion of "expressive processing." The term is meant to evoke two different issues. First, computational processes should be seen as means of expression for authors such as game designers. At the same time, expressive processing points out how "the shapes of computational processes are distinctive—and connected to histories, economies, and schools of thought" (2008, p. 4). If processes determine the techniques and logics that make things work, *procedurality* is often used to refer to the ways of creating, explaining, or understanding these processes (Bogost, 2007, pp. 2–3). Much of the theorization influenced by software studies places this concept at the heart of its agenda to understand video games as software artifacts. While Bogost calls for "procedural rhetoric," a new type of rhetoric tied to the computer's ability to run processes and execute rule-based symbolic manipulation, Mateas argues in favor of "procedural literacy" that helps scholars "grabble with the essence of computational media" (2005, p. 101).

A crucial starting point for procedural approaches is Murray's ([1997] 1998) notion that the uniqueness of digital games is, among other things, based on their procedural nature. In other words, digital games are always intimately tied to the ways in which computers operate. Procedural systems excel in generating behaviors that are based on rule-based models. Rather than creating representations per se, software authors such as game designers write code that enforces rules to generate representations (Bogost, 2007, p. 4). Accordingly, much of the meaning of the game is argued to be encoded in the procedural rules (Mateas, 2005). Simulation rules are applied to present embedded values, and by decoding and appropriating this ensemble, players generate the meaning. Thereby, procedurality is not only seen as a key characteristic of video games, but also “as the *specific* way in which computer games build discourses of ethical, political, social and aesthetic value” (Sicart, 2011).

In his overview of procedurality, Sicart (2011) pays attention to how the aforementioned arguments work to justify the cultural validity of video games as an important medium of expression and thereby provide an alluring discursive basis for serious games design. However, the benefits of proceduralism are, according to Sicart, often accomplished by disregarding the creative and expressive involvement of play and players. Accentuating the role of coded rules in meaning making may lead to the conceiving of players as mere activators of embedded meanings. At the same time, empirical studies indicate that players actively negotiate, change, and discard rules and create entirely new and unexpected uses for video games (Taylor, 2006; Consalvo, 2007; Sotamaa, 2010).

Taking seriously the creative, subversive, and productive aspects of play that highlight the co-creative nature of ludic experience leads us to question the key hypotheses of proceduralism. At the same time, the forms of player production suggest that software can indeed operate as a powerful medium of expression, not necessarily only for designers, but at least as importantly for the players of these games. As Manovich (2001, p. 258) argues, different forms of new media make it hard to establish clear boundaries between production tools and media objects. Game cultural phenomena such as game modifications and machinima movies nicely highlight the nature of video games as malleable and re-programmable software artifacts. In the hands of avid players these artifacts turn into tools and versatile means of expression (Jones, 2006, pp. 269–270; Sotamaa, 2009, pp. 90–91).

This section has highlighted both the expressive potentials of video games and the creative gaming practices that surround them. This logically leads us to examine the overall cultural and social nature of video games. After discussing games as material objects and software compositions, the final part of this essay will take a look at video games as cultural artifacts.

Symbolic Meaning Making and Socially Constructed Technologies

The particular cultural nature and role of video games has been actively debated in the game studies community over the past decade. These days it is widely agreed that the creative involvement of the player is a necessary and characteristic element of any game. In other words, games must be played as their meanings are inherently co-created in a dialogue between game developers, game systems, and game players. Mäyrä (2008, p. 19) differentiates between *semiosis*, meaning making through decoding of media representations and *ludosis*, meaning making through playful action. Thus, while understanding contemporary video games necessitates skills similar to those needed in watching movies, listening to music, or reading poetry, games also entail and require a variety of competences specific to them. In the process of learning the game, a player acquires not only the explicit rules but also the implicit conventions and guidelines of the game. Accordingly, players simultaneously adopt both the practical ways in which the game is played and the larger notions of what it actually means to play a particular game (Mäyrä, 2008, p. 19).

The actual meanings attached to playing video games are still largely dependent on the socio-cultural context of this play. According to social constructivist accounts, one should never take the meaning of a technical artifact as residing in the technology itself. Instead, technological systems such as modern video games acquire their meaning through a complex collection of social interactions. Analyzing the interpretive flexibility an artifact possesses makes us more aware of the interests, choices, and value judgments that steer the stabilization of particular meanings over others.

Giddings (2005) argues that approaches grounded in humanities and social sciences are often too limited in their notion of agency. Stretching the idea of interpretative flexibility to an extreme will inevitably lead to underestimating the impact of the technologically-based foundation of video games. Giddings points out that proper analysis of the instances of play and their wider contextual frames requires a recognition and theorization of technological agency and that game studies would in this respect benefit from consulting the actor–network theory (ANT). ANTian approaches aim at overcoming the human/nonhuman divide in distributing agential properties and conceiving artifacts as embodied knowledges and actions (Latour, 2005; Shiga, 2007). Accordingly, video games and their players should be approached as a network of actors that both work together and influence each other. Artifactual agency works in subtle and intricate ways, but as machines become more complex their agency seems to become increasingly believable. Online play, defined by a network of routers, protocols, access codes, distribution platforms, software updates, rating algorithms, community services, and many other components, is a paradigmatic instance of a system that carefully specifies who can play and on what terms. Furthermore, it is not uncommon that players intentionally attribute agency to nonhuman actors such as machines that run specific cheating software or macros designed to automate selected game tasks through artificial intelligence routines.

As implied by the general definition discussed in the beginning of this essay, the term “cultural artifact” is often used when referring to something that is found to be characteristic of our time and culture. Thus, an artifactual approach aims not only to reveal the “constructedness” of video games, it can also be used to uncover what video games are actually able to teach us about life in today’s society that is increasingly defined by omnipresent global networks of circulation. Kline et al. (2003) describe video games as the ideal commodity of post-Fordism that —both in production and consumption—embody the central forces of the current regime of accumulation. If typical Fordist commodities such as cars, suburban housing, and appliances were characterized by “massification, durability, solidity, structure, standardization, fixity, longevity, and utility,” post-Fordist commodities such as video games are governed by a metalogic of the “instantaneous, experiential, fluid, flexible, heterogenous, customized, portable, and permeated by a fashion with form and style” (2003, p. 74). With their ability to effectively colonize people’s leisure time and to provide the basis for entirely new industries and markets, video games may seem like a “dream” commodity for post-Fordist capital. At the same time, games and their reliance upon a workforce of digital artisans and netslaves also highlight “the most acute instabilities and uncertainties of the new regime” (2003, pp. 76–77).

This quick overview of games as cultural and social artifacts shows that by being critical of both technological determinism and social reductionism, game studies can move on to examine more closely the exchange of properties between video games and their players.

Coda

I began this essay by discussing the material manifestations of video games over the decades. Given that we are talking about *digital* games, this may not have been the most obvious point of entry. The later sections of the essay have, however, confirmed the central importance of this perspective. As it limits any consideration of materiality and technological agency, Giddings (2005) notes how taking a critique of technological determinism to an extreme and focusing solely on the symbolic aspects of video games can be damaging. Software studies take a critical stance toward the supposed "immateriality" of software and brings out how the materiality of software operates in many scales through limitations and affordances it provides (Fuller, 2008, p. 4).

All in all, the artifactual approaches discussed in this essay open various intriguing opportunities for video game studies. Together they provide understanding of both how games function and get their meaning and what is the relationship between games and their players. The concept of "artifact" helps us to conceive of the forms of technological agency invested in video games and their material manifestations. Perhaps most importantly, turning focus on games as artifacts can help create dialogue between perspectives that stress the power of game systems over their players, on the one hand, and standpoints that accentuate the creative and productive potentials of play, on the other.

Finally, as Parikka (2012) points out, materiality is not just machines and objects, but is closely associated with the global circulation of raw materials, goods, and waste. The video game industry not only relies on constantly changing hardware based on minerals mined in developing countries and produced in undesirable working conditions by cheap labor, but it also generates remarkable amounts of electronic waste. Similar to other electronics, gaming equipment is often discarded after a relatively short use-period. Most manufacturers have developed reuse and recycle programs, but three decades after Atari's infamous video game burial, significant amounts of computers, mobile phones, and game consoles are still dumped into landfills and incinerators or exported to scrap yards in developing countries. In addition, cloud services, widely advertised as a clean and trouble-free alternative, are based on data centers that consume tremendous amounts of electricity often generated from non-renewable sources of energy. So far, the academic study of video games has done very little to connect the constantly increasing consumption of natural resources and energy and the toxic substances leaking back into nature, to the entertaining and moving experiences provided by video games. As game researchers, we should pay more attention to this complex artifactual nature of video games all through their lifecycle.

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2

ARTIFICIAL INTELLIGENCE

Robin Johnson

Artificial intelligence (AI) in video games can be defined as components of software code responsible for executing intelligent behavior by game elements such as general opponents or opposing or cooperating non-playable characters (NPCs) during gameplay.

The goal of AI in commercial video games is to produce believable behavior that is predictable and unpredictable and feels as if the player is being challenged and given interesting decisions to make in relation to an intelligent agent or character. Game AI has also been developed in the academic field of AI research. The goal of academic research is to create AI that is able to beat the world's best players in games such as chess. However, this is generally not the goal of video game AI as it has been developed in the commercial video game industry.

AI is achieved by writing computer code that mimics the thought processes of humans or other living beings. And according Ian Millington and John Funge (2009), video game AI mostly comes down to figuring out how to make characters move and where they move as well as oppositional or coordinated thinking using tactical or strategic decision making. This works in gameplay when game AI receives information from the game space or world, runs strategies, movements and decision making on a processor that executes some on-screen activity that displays or demonstrates the AI to the player. These will determine what kinds of reactions need to be animated for each situation.

Speaking at a Google Tech Talk in 2010, game designer and AI programmer Soren Johnson, who has created games such as *Spore* (Maxis, 2008) and *Sid Meier's Civilization IV* (Firaxis, 2005), situates video game AI along a spectrum. At one end is AI that is meant to beat or mimic a human player. At the other end is AI that is meant to create a fun, challenging experience for the player to overcome and AI with its own goals separate from that of the player. Game AI in single-player strategy games tries to simulate the tactics and strategy used by an opposing human player, and the game AI should be able to choose from the many different tactics a human player would use to win the game. Questions about this type of game AI's effectiveness revolve around simulating what an actual player would do in a given situation.

At the other end of the spectrum, Johnson (2010) continued, the player engages with the game AI as part of the game's environment. Game AI will have different goals than the player, and it may engage in different tactics or strategies. Many NPCs are not around for the whole game, so their movement, decisions, and strategies are limited. Questions about the effectiveness of this type of game AI are about whether the player is being challenged and having fun.

Techniques Used to Create AI

Over the course of video game AI's history, some standard techniques to create AI have been developed and incrementally refined. The primary technique of game AI is based on moving NPCs through the game, including determining optimal paths with pathfinding algorithms. Another primary technique is making decisions using finite state machines, decision trees, and scripting. These primary techniques have been developed further to implement strategic and tactical movement and decision making. And, finally, there is game AI built upon learning during gameplay using artificial neural networks and other techniques.

AI in video games is primarily applied to NPCs. NPCs increase the depth of the playing experience and increase the playability of the game. AI NPCs can appear to be another player in the game or characters that have their own goals, motivations, and behaviors.

NPCs can be programmed to detect and react to what is happening in the game, and they can be programmed to remember what has happened before and take this into consideration when determining a reaction. They can also be given goals and subgoals to perform so that it is not entirely based on reactionary behavior. To highlight one example, in *Resident Evil 5* (Capcom, 2005) or the *Left 4 Dead* (Valve, 2008) series, if the player is suffering from major depleted health, a cooperative NPC will take this into account and then move toward the player's avatar to provide a health boost because imminent death and severe reduction in the ability of the player's avatar to move overrides other actions during that moment of gameplay. This also triggers an audio response by the NPC telling the player to be careful.

One of the most frequent requirements in game AI is to have NPCs move from one location to another. Movement algorithms are created by factoring in geometric data as an input and determining the output geometric data or where the NPC is in the game world and where it should travel. Additional information such as velocity of movement, dimensional space, the direction the character is facing, obstacle avoidance or collision detection, and steering are used to vary the movement of NPCs.

Millington and Funge (2009) write that kinematic movement and steering behavior algorithms are the primary movement systems in video games. Seeking and fleeing behaviors are used when a character searches for or moves away from some target such as the player's character. The NPC's and player's locations in the game are the inputs for the algorithm. With seeking behavior, the direction to the target is determined as well as the velocity and acceleration to get there. And fleeing is the reverse process. The seek algorithms factor the gradual slowing of velocity as the character gets near to its target in order to create realistic movement. Additional optimizations are used to give the appearance of following a target without catching it, wandering toward a target, aligning with the orientation of a target, and meeting a target at a predicted point of travel.

AI is integrated into crowd simulations. This allows designers and artists the ability to set different responses of NPCs in a crowd to a similar event. Some characters might execute a run animation while others stand, too stunned to move. An algorithm generating separation or repulsion behavior for the NPCs is used to maintain believable distance and avoid excessive crowding among characters (Millington & Funge, 2009). Pathfinding AI, which is the movement of NPCs around a game world in believable, optimal, and intelligent ways, is considered by game AI authors and programmers to be one of the most-used techniques of AI in video games.

When pathfinding results in irrational movement such as through walls, environmental barriers such as rivers, or taking the longest possible route, the playing experience is lessened. Players are willing to engage in some suspension of disbelief about AI as long as the NPCs appear to be able to move through the game space in an intelligent way.

One way that AI programmers have developed intelligent and optimal movement of NPCs is through the A* (pronounced A-star) algorithm. In general, the A* algorithm calculates the best possible route from one location to another in the game world by comparing waypoints, their connections with other waypoints, and assigning values to each waypoint in a graph. Each successive waypoint with the best value in terms of distance and speed of travel among the other options is the path on which the NPC will move (Matthews, 2002).

The waypoints and connections used by the A* algorithm are translated into division schemes to account for the movement of characters along paths in a game level. Game worlds are divided up into grids consisting of square tiles, polygon meshes, or visible locations, and waypoints are represented by each tile, polygon, or point of visibility (Millington & Funge, 2009). Additional refinements to pathfinding can be implemented to make character movement smoother, based upon human trip planning, and reevaluating paths to account for changes during gameplay.

Having characters avoid collisions with game objects is another routine function of game AI based upon character movement. Avoiding other NPCs is based on the same principles of separation movement described above. NPCs are represented by a sphere of collision around them and are assigned cones of vision, and factors including velocity and position determine whether the characters' trajectories will cross. The potential to cross trajectories activates the separation movement. Small obstacles can also be avoided using the same technique, while avoiding large obstacles such as walls require the use of multiple casting rays that act as feelers that can detect walls and other large objects. The A* pathfinding algorithm is also combined with obstacle detection and avoidance measures to ensure that waypoints do not connect through environmental or other obstacles in the game.

Decision making is another important aspect of game AI. Characters not only need to move but to make decisions about what to do during gameplay. Some of the most common decision making game AI techniques include decision trees, scripting, rule-based systems, and state machines. NPCs make decisions based upon internal knowledge the character possesses and external knowledge from the game world. Internal and external knowledge are the input for decision making algorithms, and the output is either an action that is carried out or a change to the internal state of the character (Millington & Funge, 2009).

State machines and decision trees have finite states of operation and can range from simple to complex. This type of video game AI technique is used to make a decision to change the artificial NPC agent from one state to another or to perform an action based upon a range of inputs. State machines, sometimes called finite state machines in the industry, start with an initial state and transition into a new state if there is a change input that triggers the need for a new action.

The decision tree is similar in nature to state machines. A decision tree assesses an initial component of game play and then makes a determination to select from a range of sub-decisions. Starting from an initial yes/no decision, decision trees ask a series of questions with usually two possible answers until the correct decision is made. The character then completes the action.

The movement of NPCs monitoring an area during a stealth mission is one common example that can be used to explain state machines and decision trees. For a state machine, the initial state would be to monitor an area for the player. If the NPC spots or thinks it has spotted the player, the NPC's state changes. Any number of target states can be programmed as decisions such as search for player in area spotted, sound an alarm, alert other NPCs and wait for reinforcements before moving to the area, flee, and so on. Two or more state machines can be combined for more complex decision making. If the character has to find more ammo or heal before monitoring can begin, that state machine (search for ammo/health) would supersede the monitoring state. To use the same example, a decision tree starts with the initial question, can the NPC see the player? If no, then the NPC will continue to monitor. If the player is seen, another question can be asked such as does the NPC have enough health to attack? Any number of subsequent decisions can be added to the decision tree, depending on the game.

Although scripting as a game AI technique is no longer used for decision making in complex games, it is important to discuss because many PC games rely on scripting as a way for players to mod game character behavior, according to Millington and Funge (2009). Scripts are lists of rules that are executed in a sequence. In complex games scripts can become quite long and might be open to exploitation because they are not adaptable to changes in a player's strategy. Dynamic scripting is a type of adaptive learning mechanism that can alleviate some of these issues (Spronk et al., 2006). Dynamic scripting selects from a list of scripts depending on player's actions or different contexts during gameplay.

In strategic opposition AI, the AI consists of a computer player that takes over the other side of the game, such as a chess opponent or a real-time strategy (RTS) or turn-based strategy opponent. Turn-based strategy games were early adopters of strategic opposition game AI. It is based upon having a computer opponent able to compete tactically against the player, taking into account a multitude of information such as unit-level AI and developing an overall winning or competitive strategy. RTS games have built off the early successes of turn-based genre, and its strategic opposition AI has to take into account multiple units engaging in pathfinding as well as tactical decision making during gameplay.

Although there has not been heavy use of AI in video games adopted from academic AI research, there have been successful attempts to incorporate neural networks, genetic algorithms, and other artificial life concepts. An adaptive game system, also known as artificial life or A-life, is a technique that uses AI to learn players' behavior and adapts the gameplay based upon this information. This is used for dynamic adjustment of difficulty level of play among other things. Also an adaptive game system such as in the *Elder Scrolls* RPG series learns a player's preferences and suggests the appropriate class and attributes.

Genetic algorithms are a type of artificial life that is based upon biological or evolutionary theories in natural science. This type of AI has been developed in the academic field as a way to simulate the process of evolution. The most well-known games that have implemented artificial life techniques are the *Black & White* series and the *Creatures* series.

Lecky-Thompson (2008) writes that neural networks try to mimic the way a human brain is organized using memories and learned responses. Neural networks are used to simplify the code by relegating certain tasks to trained nodes. They also can be used to create adaptive AI in games where the game learns from the player's actions. Neural networks take up more processing space, so their use has been limited in the video game industry because of the processing requirements of graphics and audio resources. Nevertheless, neural networks are common in racing simulation games.

Video game AI is critically acclaimed and appreciated by players when it is combined with other game and narrative elements. For example, *Uncharted 3: Drake's Deception*, (Naughty Dog Software, 2011), won game of the year in AI by editors of AIGameDev.com for excellent NPC companion AI that combines great writing, character development, motion capture animation, and AI.

Game AI is also used by developers to vary difficulty levels for different players. Game AI can be adjusted to make it increasingly harder for players who are looking for a more difficult challenge. AI NPCs can be more accurate in their shooting, or there could be more NPCs attacking a player at once. For players who like to play for the interactive narrative experience and get frustrated by hard-to-beat scenarios, the AI NPCs can be less accurate in shooting, move slower, or make tactical mistakes or poor decisions.

History of Game AI Development

Game AI has existed since the beginning of the video game industry, but other major concerns driving the industry such as real-time graphics processing and graphical realism were the focus for the majority of the history. *Pac-Man* (Nameco, 1980) offered an early implementation of a decision network (Lecky-Thompson, 2008). Each of the ghost NPCs had a hunting or chasing state and a fleeing state, and each hunts or flees semi-randomly or in a direction determined by the player's location. Even though this state machine was a primitive algorithm against today's standards, players had a feeling that the NPCs had minds of their own and were working against the player.

Graphics rendering is a significant strain on the CPU (Central Processing Unit). In early game development, studios often left game AI late in the production process and didn't hire AI-specific programmers (Tozour, 2002). It is now generally acknowledged by industry experts that game AI needs to be developed alongside or in tandem with game design even though there are challenges with early implementation. AI programmer is now a recognized job title in the industry, and major game studios specifically hire programmers to focus entirely on AI.

Before the boom in the home console and handheld markets, game AI was a feature of games that were meant to be played in an arcade. The goal of game AI in the development of early arcade games such as *Space Invaders* (1978) and *Pac-Man* was to implement opposition AI with rules, scripted actions, and random decision making to challenge the player and keep the quarters flowing (Tozour, 2002). There was little development or advancement in game AI until the late 1990s as games started to demonstrate AI techniques such as sense simulation and pathfinding, particularly when RTS games were developed.

Additional strides were made to game AI starting around 2007 after game studios had enough development time with the Xbox 360 and PlayStation 3 (McEachern, 2007). Multiple processors in game hardware allowed more computational memory to be freed up for AI. Multiple processors allow game AI and other functions to be processed parallel to one another. Notable games with the latest generation game AI that came out in that year include *Halo 3* (Bungie Studios) and *Call of Duty 4: Modern Warfare* (Infinite Ward) with enhanced tactical combat AI.

Assassin's Creed (Ubisoft) improved the performance of crowd simulations, pathfinding via climbing and steering behaviors, while *Mass Effect* (BioWare) included innovations to storytelling and decision making that adapts to game play. Prior to the 2000s, artificial intelligence was primarily reactive. There have been innovations that allow AI to learn from the player's actions and adapt behavior. Very recently, game AI has become a marketable feature or at least a feature that game developers highlight in discussions with game journalists and at trade shows. Additionally, AI middleware products are available for game developers (McEachern, 2007).

Like other aspects of video games that emphasize technological progression, AI has an ideal goal that programmers and designers discuss—passing the Turing test. The Turing test was named after Alan Turing, who said the ultimate test of computers was building machines that could pass as humans. In video game AI's version of the Turing test, game AI should be able to provide realistic humanlike playing capabilities. Like the video game industry itself, game AI development is a source of iterative innovation.

Games with Innovative Game AI

There are a number of video games or game series that are known specifically for developing innovative game AI. The specific type of game AI used in video game development is intimately tied to the genre of the game. Within each genre, game AI techniques that have proven to be successful have evolved and iterations of improvements have been made.

The *Black & White* franchise was developed by Lionhead Studios and intentionally showcases the potential of adaptive video game AI. In *Black & White* (2001), the player is put in charge of various tribes on an island. The game's successful use of machine learning techniques based upon the player teaching his or her AI creature is one of the central elements to this god and strategy series. The creature learns from the gameplay and from the player's rewarding or punishing actions. So depending on the player's actions, the creature will develop in unique and unexpected ways. For example, the player can choose to be a mean and hurtful god by throwing characters around or throwing rocks at them. The creature will observe this behavior and adapt by doing similar hurtful things. Players have remarked that their creatures do very surprising things that they wouldn't expect based upon their punishments, rewards, and teaching activities.

The *Creatures* series by Millennium Interactive has been on the forefront of the development of artificial life in video games, beginning in the 1990s. The first *Creatures* game was the first to apply machine learning to a video game. The games in the series simulate psychological and physiological learning processes in the creation of creatures called Norns, each of which is unique based upon the player's input. The *Creatures* series has highly sophisticated game AI that uses neural networking for each creature. The creatures can learn to talk, feed, and defend themselves. The series is considered innovative because the Norns behave and evolve like real-life animals (Zielke et al., 2009).

Valve's *Half-Life* FPS franchise about a scientist fighting teleported aliens has been celebrated for developing excellent tactical AI systems. NPC enemies in *Half-Life 2* (2004) run through a number of different decisions when attacking a player. They can choose any combination of throwing grenades, laying down suppressing fire, and moving to better cover. The result is video game AI that is thoughtful about military strategy, employing the best tactics to achieve the NPCs' goals. In addition, enemy NPCs in *Half-Life* and *Half-Life 2* work together as a unit. As a group, they determine how to surround the player, with some flanking by moving past the player's location and others taking a direct approach.

Half-Life (1998) provided some innovative game AI that is now consistent features in contemporary video games. The "cut scenes" were interactive. Scripting and AI was used so that the gameplay was not interrupted. Also, a cooperative NPC was used and squad AI was developed. Bungie studio's *Halo* series was also an innovator in cooperative and enemy combat AI. In the first game of the series, enemy AI used cover and suppressing fire and made decisions based on the context of the battle. The developer's use of behavior trees was adopted by many other game developers.

The *Left 4 Dead* series and other games created by Valve use a database system to generate dialogue of and among characters (Ruskin, 2012). During gameplay, dialogue queries are run that factor in the state of the game, what the character sees, which characters are alive and in what health, what enemies are approaching if any, and the current location on the map. Characters speak based on choosing the best response among many fitting the query. This makes it appear as if the characters are intelligently using highly context-specific comments rather than canned responses. The AI also remembers what has been said and can also generate conversation among the characters because dialogue queries can also generate a response to the previous dialogue based upon whichever character has the best response.

Michael Booth (2009) of Valve has written about *Left 4 Dead's* other AI innovations, including reactive path following that offers smoother pathfinding and climbing behaviors, the development of complex behavior systems for cooperative NPCs, the use of multiple AI systems to randomize the generation of loot and enemies to promote replay, and the use of algorithms to dynamically change the pace of gameplay to heighten intensity and player excitement.

The Sims franchise, developed by Maxis and now EA's Sims Studio, is a life-simulator game that gives the player control over characters in various settings. For movement, the character's needs determine what objects the character will move to. For example, if the character needs to be inspired, it will generally move to the nearest object such as a painting in an adjacent room. This means that the objects in the world play a significant role in the game AI because the characters interact with many different objects that fulfill needs and desires such as hunger, thirst, cleanliness, inspiration, entertainment, education, and many more.

The Sims games use fuzzy logic for the characters' emotions and physical states. Each of the basic feelings such as hunger or being social have a minimum and maximum value range that are mapped onto the characters' mood. The most essential physical states such as hunger or sleep become the overriding concern, meaning that other emotions are put on hold.

The Sims 3 (Sims Studio, 2009) extended on the game AI of the previous games in the series by expanding the environment to include a whole town of Sims as well as offering numerous personality types and desires. In order for the game to be effective and entertaining, the game AI has to do more than just basic living (eating, sleeping, or using the bathroom) for all of the characters. The NPCs that populate the town have their own personalities and relationships with one another as well as careers. This gives the NPCs artificial life.

Third-person, open-world action adventure game *Red Dead Redemption* (Rockstar Games,

2010) developed a highly sophisticated wildlife simulation and offered fully integrated AI systems, including crowd simulations, enemy movement, cover, and pathfinding. The wildlife simulator that features birds, cougars, snakes, dogs, wild horses, and bears just to name a few are able to reason about hunger, thirst, and to respond if they are threatened (Champandard, 2011). The generation of the different animals is dependent on the geographical location, so different animals populate different regions, including deserts, mountains, rivers, and plains. The wildlife AI leads to some exciting and unexpected gameplay such as the first time a cougar knocks the player off his or her horse in a strike from behind. With so much of the wildlife scampering away when the player is near or hunting, to suddenly be the hunted demonstrates the game AI's different animal reasoning systems.

The scale of the NPCs is also indicative of high-quality game AI. The developers created 800 characters, and each had their own unique voice. Instead of using a finite state machine for all of its NPCs, *Red Dead Redemption* uses behavior trees for more than 200 NPCs that govern their daily life in the world. NPCs also had personality profiles that determined whether they were reckless, aggressive, cautious, etc. And these personality types governed how NPCs act in battle and in other areas such as playing card games (Champandard, 2011).

Building increasingly intelligent and believable behavior for video game characters is getting increasing attention in the industry as game companies search for an edge over their competitors. But AI programmers still have to fight for resources, and it is difficult to convince executives that having a superior AI system should come before or even at the expense of superior graphics. Gamers and game critics can judge the quality of the look of the game while overlooking AI because, at the moment, good AI hides in plain sight. Gamers complain when AI is bad, but they may never notice a great or innovative AI system. Still, there are established studios such as Ubisoft Montreal and Guerrilla Games that are dedicated to advancing game AI. And the further development of the independent game scene offers another space for innovation. Independent designers and AI programmers are creating AI-based games that explore new genres built upon character development, social interaction, and social complexity.

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3

CONTROLLERS

Sheila C. Murphy

While video game studies has, quite rightfully, focused much attention on game actions and representations depicted on-screen, interactivity and, crucially, modes of input for interactivity, are the literal engine that drives all video gaming. Without inputs and interaction, a game is an inert set of codes. But input and interaction must be structured to produce what both gamers and designers seek most: compelling gameplay. Historically, video game controllers have encompassed a wide range of analog and digital devices that serve as the point of input—the intersection—between gamers and a game. While individual video game systems come with standardized controllers and game interfaces that are intended to be used across a range of game genres, third-party controllers custom-built for specific genres and even specific games, have been part of the industry since its early days. Whether paddles, joysticks, buttons, analog sticks, steering wheels, track balls, keypads, light guns, or other objects, game controllers fundamentally structure the gamer's experience of game hardware and software. The controller is the yoke between player and game. It is the site of physical interactivity that links a player with his or her in-game representation and proxy, be it avatar or blip. It is also the technological degree zero for video games: it distinguishes the medium from other screenic entertainments such as cinema or television (although the TV remote control is a technological predecessor to the game controller). These other forms of screen leisure present fundamentally passive entertainments, even if one uses a remote control to select between choices. With a game controller, which also has pinball and mechanical arcade game controllers as ancestors, a gamer engages with a video game's software program, activating and engaging in real-time with the software. This seemingly humble, seemingly secondary, piece of technology is actual a crucial part of a video game system, both symbolically in the way controllers are used to navigate game content and literally, in the actual connection the controller forges between a game system and a player, as both of these components are necessary—that is, almost primal aspects of the video game medium itself. Indeed, new media theorist Janet Murray describes how a gamer's immersion and agency within a game often arise from one's identification with a controller that realistically mimics an in-game or actual object. As Murray puts it in her groundbreaking book *Hamlet on the Holodeck*: "My own immersion in the *Mad Dog McCree* arcade game depended heavily on the heft and shape of the laser gun controller and on the way it was placed in a hip-height holster ready for quick-draw contests" (1997, p. 146).

In this example, immersive game design extends to seemingly non-essential controller elements such as the light gun holster, which deepen the gamer's engagement with the game's narrative universe. From the earliest keypads, buttons, and joysticks to the handheld touch-screens and systems that scan and read bodily movement (such as the Xbox Kinect), controllers define what and how we interact with video games. As such, they can reveal a great deal about the cultural priorities and history of the video game industry itself. This essay focuses primarily upon video game controllers designed as part of game systems, not on computer game controllers or the use of computer keyboards as controllers. There is a distinct history of computer game controllers to be told, especially of the specialized controllers designed for specific games or genres, such as cockpit controls or custom joysticks. But the focus here is on game controllers designed to accompany whole systems and be used with a wide range of video, rather than computer games. While game controllers likely always draw the most attention from industry observers and gamers for their shortcomings or as objects to abuse following in-game disappointment, controllers are more than just a punching bag or punch line. Video game controllers indicate how this medium organizes itself around control, space, time, and the changing tastes amongst video game players.

Interaction and Control

Drawing upon philosophies of phenomenology, game scholars Andreas Gregersen and Torben Grodal have developed their theories of video game interactivity around the moments in which gamers fuse themselves both psychologically and physically with a game, often via game controllers. As they put it, while playing video games one enters into: "*an embodied awareness in the moment of action*, a kind of *body image in action*—where one experiences both agency and ownership of virtual entities. This is a fusion of player's intentions, perceptions, and actions" (2008, p. 67). Gregersen and Grodal's analysis of how video games engage both our body image and our body schema, or sense of the self as physically embodied in the world—smartly emphasizes how the body itself is an entity that acts and learns. This goes beyond earlier theories of video and computer game interactivity that segregated bodily engagement from psychological or intellectual engagement.

In a key passage in his critically-acclaimed study *The Language of New Media* (2001), Lev Manovich derisively criticizes the existing scholarship on new media and interactivity, proclaiming that such work mistakes *physical* interactivity for intellectual, thoughtful interaction. In doing so, Manovich, like many before him, falls into the old Cartesian trap of separating the mind from the body. Manovich writes:

> When we use the concept of "interactive media" exclusively in relation to computer-based media, there is the danger that we will interpret "interaction" literally, equating it with physical interaction between a user and a media object (pressing a button, choosing a link, moving the body), at the expense of psychological interaction.
>
> (2001, p. 57)

Yet psychological interaction begins and ends with the physical interaction of the body, because when the subject views or interacts with media, he or she does so from a specific historical and cultural context and as the occupant of a specific materiality (body). Later in *The Language of New Media*, Manovich goes on to discuss video and computer games as exemplary new media objects, but in doing so he mostly abandons questions of how identification functions in regard to new media, creating a telling absence in his text, especially since he provocatively declares: “Interactive media ask us to identify with someone else’s mental structure” (2001, p. 61). Game controllers, as the literal point of contact between the virtual and the physical, are obviously key nodal points for understanding how psychological and physical engagement and immersion have now spilled over and collapsed upon one another, at least during moments of active gameplay. But perhaps the way controllers extend out from games themselves is also evident in the more subtle ways that gamers develop so-called “muscle memory” and can physically remember or be reminded of button sequences or movements from games when away from the console.

What both remote controls and game controllers demonstrate is how deeply physical one’s interaction with the television can be. A controller becomes a second-nature component in the hand of the experienced user, who operates it by rote to navigate a game world or engage with virtual foes in a game. Video game controllers, despite their capacity to become unremarked upon and seemingly automatic “extensions” of the gamer/viewer/user, are crucial, tactile points of contact between the media consumer and his or her on-screen, digital proxy, even if that proxy is as mundane as the Xbox Live Home Screen. These are the objects through which gamer agency passes and is transformed into digital signals to be interpreted by software and hardware. Our on-screen identities or characters in a video game are all channeled through such controls.

Controller History

Remote control devices, which had first been attempted as a convenience device for radio listeners, have existed on the consumer television market since shortly after World War II, when television broadcasts penetrated the United States and television sets became reliably available for purchase (Bellamy and Walker, 1996, pp. 18–21). While we might associate remote controls with later eras, such as the 1980s when television styles themselves became more fast-cut and fast-paced, remotes did exist earlier and crucially allowed television users to imagine a way of interacting with on-screen content via a handheld device, paving the way for the kinds of interactivity that video game systems would entail in the years to come.

Beginning with the earliest television video game consoles, such as the *Home PONG* (Atari, 1975) variants sold directly by Atari and under the Sears brand name, video games have included controllers. Often the controller signifies innovation within a video game system, differentiating it from competitors through the ability to offer unique movements and interactions and utilizing increasingly sophisticated technologies to connect interaction to game software and representations. Prior to the release of the early Atari consoles for Sears, Ralph Baer designed and produced the original Magnavox Odyssey (1972). While some components for the original Odyssey blur the line between game controllers and game elements, such as the translucent, color screen plastic overlays that gave the illusion of better graphics, the Odyssey’s controllers were quite unique. These “player control units,” as they were called, were rectangular boxes with knobs or “paddles” for both horizontal and vertical movement on-screen, as well as a reset button. One of the early elements that Ralph Baer designed for the Odyssey was a light gun that would sell under the name the “Shooting Gallery” as a peripheral to the system. While both SEGA and Taito would release arcade games with joysticks that mimicked airplane cockpit controllers in 1969 and 1973, respectively, it was not until the 1977 Atari release of the Video

Computer System or 2600, that a home video game system would include a digital directional joystick. Before the launch of the Video Computer System, Atari game systems had included paddle controllers based upon the arcade version of *PONG*. Fairchild Camera and Instrument's 1976 *Channel F* is another notable example of early game controller design. While the *Channel F* is most often recognized as being the first game system to include interchangeable cartridges, its controllers were long, slender tube-shaped units with a top that could be pressed like a button or twisted directionally in eight different ways, offering relatively nuanced precision for the era. While some competitors in the 1970s introduced track balls and keypads or membrane keyboards, the aviation and arcade-style joystick quickly became popular. Both Mattel's Intellivision (1979) and Coleco's ColecoVision (1982) home gaming systems had similar game controllers that fused together elements of previous devices such as numeric keypads, knobs, paddles or "circular disks" (Mattel), and small joysticks. Again, both controllers strongly resembled television remote control devices. Mattel was also notorious at the time for promising that their Intellivision could become a fully-functional home computer with the addition of a soon-to-ship keyboard peripheral that the company eventually canceled after numerous production delays.

In the 1980s, the look and feel of controllers shifted most significantly when Nintendo launched its Nintendo Entertainment System (NES) in 1985 after the United States game market had crashed in 1983. Nintendo's controllers didn't look or work like the joysticks of old. Instead, they incorporated a cross-shaped "d-pad" or digital-pad (also known as a directional pad) and two other buttons. In this way, the d-pad allowed for a simpler interface than had dominated the previous era of game controllers. The 1980s were an era of many specialized game controllers custom-made for one or a few titles and for experimentation in controller design, as with Nintendo's cool-looking but limited PowerGlove (1989) that was based on virtual reality technologies. Nintendo's major competitor in the late 1980s/early 1990s, SEGA, was known for its innovative controller design, but the company eventually overextended itself by developing multiple competing consoles for the limited video game market.

Perhaps the next major design overhaul of video game controllers came in 1997 when Sony introduced its first DualShock controller for the PlayStation. Later, Sony controllers, as well as the controllers that Microsoft developed for its Xbox system, held to the same basic elements of the original DualShock. Designed to be held by two hands, the controller includes two motors in its handles that provide vibrational force-feedback to the gamer, as incorporated into game software by designers. The DualShock controller additionally includes two analog sticks to be operated by one's thumbs like a miniature joystick and multiple digital buttons, including directional buttons. All of these elements combine for a handheld device that can appear intimidating and clunky to the non-gamer. But force-feedback-based controllers are precisely calibrated instruments. Indeed, the original, large controllers for the Microsoft Xbox were nicknamed "Fatty" by gamers and quickly downscaled by Microsoft to a smaller size (see Jake, 2003; Caple, 2003). Ironically, these once-criticized early Xbox controllers are now sought after both for retro-gaming and for playing certain series, such as *Halo* (Yoon, 2011). The combination of analog sticks, directional buttons, and additional digital buttons also allows for a greater complexity of gameplay and combination button sequences, as well as for the design and play of games centered around seemingly nonsensical "button-mashing" that often actually demonstrate precise micro-timing of actions by the gamer.

The next major development in controller design wasn't a controller at all but the changes in computer and communications technology that allowed for video game controllers to go wireless. Video game companies, including Atari, had long experimented with wireless controllers that relied upon either infrared or radio frequency technologies. But as game systems grew more technologically sophisticated, infrared or radiotransmitted wireless controllers proved to have significant limitations interacting with game systems that had become advanced computers. Numerous third-party manufacturers developed wireless controllers with varying levels of success, but in 2002, Nintendo introduced its own wireless controller that transmitted signals via radio frequency, the Wavebird, for use with its existing GameCube system. When the next generation of video game systems was launched (the Nintendo Wii, Microsoft Xbox 360, and PlayStation 3), they all shipped with wireless controllers as standard equipment.

In 2003, Sony launched its EyeToy peripheral for the PlayStation 2. The device was manufactured by computer hardware developer Logitech, known for its webcams. The EyeToy works much like a webcam but was meant to create an immersive interface experience for gamers using games written specifically for the controller or games that could be "enhanced" when played with the EyeToy, such as *EyeToy: Play* (SCE London/Europe, 2003) or several titles in Konami's mid-2000s hit *Dance Dance Revolution* series. The PlayStation 3 has a similar motion-detecting camera peripheral known simply as the PlayStation Eye. On its own, the original Eye seems more like a gimmick than a deeply interactive device, but it significantly enabled designers to start incorporating motion detection into games, an element that would become central to both controller and game design during the 2000s.

The 2000s has seen the introduction of major innovations in video game controllers. Debuting in the fall of 2006, Nintendo's Wii Remote, or Wiimote, utilized a motion detection system based on accelerometers in conjunction with an infrared optical sensor as well as digital buttons and a d-pad, allowing the Wii to sense a gamer's bodily actions in ways that previous game systems simply could not. Indeed, Gregersen and Grodal's (2008) discussion of the player's body image in action seems all the more relevant when player actions are now mapped using one's whole body as the controller. Interestingly, the Wii Remote looks much more like a typical television remote control device than its competitors' game controllers. Yet the Wii Remote, along with a range of games such as *Wii Sports* (Nintendo, 2006) or the Wii version of the cult PlayStation 2 drawing-based game *Okami* (Clover Studio/Capcom, 2008), shifted attention toward game genres rooted more decidedly around motion and movement. In 2010, Nintendo updated the Wii Remote by introducing the Wii Remote Plus, a smaller, less cumbersome device that could more easily operate with other specialized Wii controllers such as the Wii Zapper (2007) gun and the Wii Wheel (2008), which comes packed in as part of *Mario Kart Wii* (Nintendo, 2008).

In 2010, Sony entered more decisively into the motion-based play sector of the industry with the launch of the PlayStation Move, a motion-sensing game controller compatible with both the PlayStation 3 and the upcoming PlayStation 4. The PS Move, like the Wii, also uses motion sensing technologies location tracking when used in conjunction with the PlayStation Eye, and a trigger, buttons, analog stick, and directional pad. But by far the most successful motion-based video game "controller" is the Microsoft Kinect, which also launched in November 2010 along with the pack-in game *Kinect Adventures!*, which included five movement-based sports games that users would run, jump, and maneuver through to win. The Kinect uses a combination of an infrared depth sensor/projector, a camera, microphone, and proprietary software to provide motion capture, facial recognition, and voice recognition. The Kinect device is designed to be arrayed horizontally above or just below the video display that the Xbox 360 is utilizing. When playing a game designed for use with the Kinect equipment, the gamer essentially *becomes* the game controller itself. The widespread popularity and success of the Kinect and the surging popularity of movement-based dance and fitness games that use the Kinect indicates that, perhaps, game controllers might become the tools of a more specialized class of gamers, while casual gamers continue to engage more physically and, upsetting Manovich's predictions, more deeply with video games that they motivate through their own bodily activity.

The Controller-less Future?

While one is playing a game, one enters into a complicated play with not only his or her identity but also with his or her body and its McLuhanesque "extensions." When one engages with digital media, these kind of modifications certainly take place—although no one "true" identity is uncovered *or* left behind in the process. In the case of video games, identity is most substantially modified by the ways that gamers can *control* their digital characters—and also in the ways that gamers *surrender* control over themselves and their characters in order to play. In his book *Terminal Identity: The Virtual Subject in Postmodern Science Fiction* (1993) on science fiction and technology, Scott Bukatman theorizes how contemporary subjectivity is often formed in front of the computer screen or terminal. The embodied computer–human "terminal identity" that Bukatman describes offers up interesting parallels to video games and how they depend upon a gamer's interaction and fusion with the television or computer terminal and an in-game proxy.

Like video games themselves, controllers will continue to paradoxically pull gamers in (at least) two directions at once: toward fully-embodied, physical immersion in games as we become the controller itself and toward the ever-involving, spectacular rattles and shakes of sleeker, all-encompassing virtual reality-based technologies, such as the Oculus Rift video game headset (www.oculusvr.com) or the Reactive Grip whole-hand feedback motion controller (www.tco.utah.edu/newsroom/william_provancher.php).

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4

EMULATION

Simon Dor

An emulator is an application that tries to mimic another system in order to run applications the way they were run on their original system. It is usually used by gamers interested in playing older games on newer systems: older console or arcade games on PC, DOS games in a recent version of Windows, etc. It can also be a way to play contemporary games incompatible with a specific system. In the 1990s, many video games were incompatible with Apple computers. Virtual PC, an emulator mimicking a PC on an Apple computer, was therefore an interesting option. Emulators are also used by consoles for backward compatibility: for example, the PlayStation 3 console uses an emulator to load original PlayStation games.

Emulation is convenient for any player or researcher seeking to have a substantial collection of video games without having to preserve a very large range of hardware. Arcade games are the most relevant example: it is uncommon for an individual to keep a video game arcade cabinet in his or her game collection, and each cabinet is often a dedicated-machine. The Multiple Arcade Machine Emulator (MAME; www.mamedev.org/), an arcade games emulator for PC, is therefore a way to have a collection of arcade games without owning the actual games. But emulators can only load an image of the game and do not necessarily preserve accurately other aspects of the game itself: its graphical aspects, sound precision, controllers, and original playing context. It is, nonetheless, often the only way to have access to some games. Usually, emulators add specific additional features to gameplay itself: the possibility to save game states everywhere, to fast-forward or leap backward in the game, to record a game session, etc. These new possibilities can change a game's difficulty and distort the original length of the gameplay experience.

Emulation is an important tool in building video game history. Even if it was possible to have a perfect emulation of an original game, most analyses focus on *play*, which cannot be easily preserved. I seek here to elaborate on the virtues of using emulators as an archiving tool and as a means of accessibility, but still want to indicate the limitations of integrating emulation into game studies. Video game history should not only be a project of preservation, but also one of contextualization.

Usages and Consequences of Emulation

A work of digital art can be lost in less than ten years; if not permanently lost, digital artworks are usually at most inaccessible (Winget & Murray, 2008, p. 1). Floppy disks will last a maximum of 30 years (Edwards, 2012, p. 1). CD and DVD lifespans vary a lot depending of the quality of the products: some recent DVD-R could last less than five years, some CD-R are expected to last between 30 to 45 years in controlled condition, while a lot of CD-R should be readable for more than 45 years (*Final Report*, 2007, p. 16). But any video game support is in some way ephemeral, whether it is a CD-ROM, cartridge, magnetic tape, or hard drive. Emulation seems like a normal response in order to preserve at least a virtual image of a game. In most emulators, a game will be preserved in a computer file, usually referred to as a "game image," for it is an exact replica of the game's original software.

But emulation changes the gaming experience in different ways, whether because of the player's hardware or the emulator's lack of precision itself. For instance, different screens render graphics in different ways. A 1980s NTSC TV set is not as precise as a 2010s DEL screen. The cathode-ray tubes of home TV sets and arcade cabinets give a blurry quality to the graphics that masks "imperfections" in the final render (Therrien, 2012, p. 15). In terms of preservation, a sharp-edged pixel is not faithful to what a common player experienced in the 1980s. Even pixel aspect ratios are different from one screen type to another. Moreover, the GameCube and Wii emulator Dolphin can upscale the original resolution up to 1080p, which of course is not faithful to the original conception.

Console games' controllers can be replaced in emulators by a keyboard or any joystick. PC gamepads can to some extent be similar to console controllers, although the shape, the distance between buttons and the directional pad can have a big impact, especially on games that require quick actions such as fighting games. *Arkanoid* (Taito, 1986) used a spinner control in its arcade version, and even though a replica was built by some MAME developers, the initial accuracy was never really completely achieved. The NES Zapper, which was used in *Duck Hunt* (Nintendo, 1984), works by light feedback from the screen, but only works with a cathode-ray TV. Some emulators let you replace this kind of accessory with a mouse: it adds an aiming overlay over the game image and your mouse becomes the shooting device. *Yoshi's Safari* (Nintendo, 1993) in a ZSnes emulator, for instance, looks like a desynchronized browser-based flash game when using this method.

Emulators tend to be a tool for accessibility, rather than a tool to preserve the intact object and its original context. Most emulators use high-level emulation, which means that instead of reverse-engineering the console itself, they will simulate its functionalities (Fenlon, 2012). They are coded so that popular games run correctly: the emulator recognizes the loaded game and uses specific hacks in order to run the game. It is easier to use high-level emulation, considering that each game has specific needs and would thus require a large amount of time and processing power. At the end of the 1990s, Nesticle could emulate NES capabilities with around 25MHz, at the cost of precision. Today's most popular NES emulators are Nestopia, which requires 800MHz, and Nintendulator, which requires 1.6GHz (Kuchera, 2011, p. 1) and these have greater precision than their predecessors. These processor requirements were not met by most if not all home computers in the 1990s.

This goal of precision is often central for some emulator projects. For those behind the MAME project, playing the game is considered merely a "nice side effect" (MAME, n.d.) from their objectives. Sure, you have to actually play the games to see if the emulation worked; but making games easily playable (on a modern PC) is not a specific goal they pursue. With a similar philosophy, the bsnes emulator was created by byuu—a pseudonym—with the idea of creating an efficient SNES low-level emulator, which means that accuracy has priority over playability. There can be problems when precision in emulation is not a clear and central objective. High-level emulation is not always faithful to the original, even in terms of gameplay. In *Air Strike Patrol* (Opus, 1994), for example, an isometric shooting game for the SNES, there is a shadow drawn under the aircraft the player controls. Since it is difficult to render, it will not show up with a common emulator (ZSnes or Snes9X, for example)—and the typical player will not know that it should have been there. With a shadow in place (in the bsnes emulator), you can drop bombs with more precision (Kuchera, 2011, p. 1). If you cannot see this shadow, the game thus is more difficult than it actually was on the original system. Accuracy through emulation is therefore an important goal for historical purposes, though never completely possible or measurable.

Even bugs are important to preserve from a historical perspective. *Star Fox* (Argonaut Software, 1993) used a specific chip, the Super FX, in order to push the SNES system to its limits in graphics rendition. As a result, console players with the original SNES system experienced slowdown while playing (Kuchera, 2011, p. 1). An accurate emulation should in theory restore these imperfections in the final render, but it is not always the case. You will never know if an obscure game you load within an emulator is correctly rendered, if you don't have the real functionality of the original hardware. Obscure games—and obscure game platforms—also tend to have less documentation about them that can be used to evaluate a given rendition of a game. As such, common emulators' developers will make sure popular games are adequately emulated and will use game-specific hacks to do so, but they cannot guarantee that rare games are executed correctly. Byuu's goal with the bsnes emulator is to reverse-engineer the machine, in order to make sure any game is correctly rendered without having to fix every bug game-by-game (Kuchera, 2011, p. 2).

Of course, preserving a virtual image of a game image is something, but the gaming context is much wider. The place in which a gaming experience occurs gives it a general ambience: arcade cabinets were often placed in arcade, with noisy pinball machines' mechanics and chimes, loud music, low lighting, etc. Arcade cabinets are designed to give a specific experience that a common computer desktop cannot render. For the purpose of convenience or immersion, game cabinets differed from one game to another: racing games featured a driving wheel and pedals, card games can appear on a "cocktail" table cabinet, etc. Even the simple ambience of a console in a 1980s living room on a small TV set is not the same as a researcher's office computer screen. Since most emulators are for the PC, it is rare to see a handheld console game still being "handheld" through an emulator.

Multiplayer console games can usually be emulated normally, with a different controller for each player. Some browser-based flash emulators like NESBox let you play online with friends in an Internet browser without any prior installation. But you will not have a similar gaming experience when your opponent is not in the same room. DOS games with modem or LAN multiplayer are harder to emulate, and very dissimilar to the experience of what a phone-line dial-up modem could give. Even when you can emulate a multiplayer game, a vivid online community does not necessarily exist. Emulation can't revive MUDs (multi-user dimensions) or MMORPGs (massively multiplayer online role-playing games) communities when they disappear.

Accessibility

Emulators are a means for accessibility for game studies, for research as well as for teaching. If a teacher wants to analyze a specific SEGA Master System game sequence in the classroom that should be played beforehand by their students, it is easier to make a saved game available for them online with an emulator rather than to have a cartridge shared and to risk your saved game to be overwritten. Researchers can exchange game states over the Internet in the same way.

A lot of old games can be obtained legally by emulation. The Good Old Games website (www.gog.com/) is a good example of how emulation can put old games back into the commercial circuit. Amiga Forever, World of Spectrum, and MAME have gained the rights from many games' copyright owners to put free downloadable games on their websites.

In other cases, the copyright problem is unclear. Some games fall into the "abandonware" category. A video game company can go bankrupt or be sold to another one, leaving some games' copyright ownership in a gray area. Technically, though, "abandonware" are still illegal to copy (Edwards, 2012, p. 1). But to some extent, using emulation to show games in a classroom could be considered "fair use," as Clara Fernández-Vara suggests (Cifaldi, 2012). The ZX Spectrum, for example, is a computer that was never released in North America and emulation is the most convenient way to give an impression of that machine's possibilities outside of its original distribution regions.

Minimal accessibility is a condition for some game systems research. As Bernard Perron and Mark J. P. Wolf remark in *The Video Game Theory Reader 2*, game scholars usually work on games that are the most accessible to them (2008, p. 9): contemporary games rather than earlier ones, recent console games rather than arcade, handheld console, or Amiga games. In fact, the technological gap that needs to be bridged in order to run older games can be quite great, even for games from the 1990s.

Say you want to emulate DOS games through DOSBox, one of the most famous emulators. First, of course, you need to know how DOS works in order to run any game with it. But you also need to know the DOSBox-specific code. With textual inputs, DOSBox lets you simulate specific partitions, CD-ROMs, and floppy drives. Through a configuration text file, you can also configure screen resolution, windowed modes, speed, sound cards, etc. While there is a tutorial to explain basic functions, it is not always easy to find out how specific games can work, unless you download a game already configured for DOSBox.

Such is the case for a lot of games sold through the Good Old Games website. If you buy any game running on DOS, Good Old Games will provide you with a preconfigured DOSBox application with already defined parameters in order to make it compatible with recent operating systems. However, you may still have to configure some parameters manually if you want to respect the aspect ratio and resolution of the game's screen or if you want the game's speed to be playable. With DOS games, there is not necessarily a "correct" speed, since there is no standard in hardware. Even if a game seems to work, it is difficult to tell if the game's speed, graphics, and sound are rendered in a possible way for a computer of the game's period.

Other games running with older versions of Windows are more complicated to emulate. VirtualBox lets you configure in details a computer with a specific operating system, provided you have a copy available to install. But running a game on an older operating system is not as simple: you will usually need to install drivers for mouse, keyboard, graphics, etc. Having a stable emulated system is not an easy and quick thing to do for those without the necessary expertise.

A New Layer of Contextualization

To some extent, the context in which emulators appear is, from a researcher's perspective, similar to what the appearance of VHS was for film scholars in 1976. Michel Chion (2012, p. 13) reminds us that in this period, movies were watched either in theatres or on television, which means that they were seen and heard in a contiguous and limited time. The viewer in this context can't stop the movie to see an image in detail. Any film analysis of this period is only meaningful if its original projection context is taken into account: researchers who can watch a sequence as much as they want have to be aware of this technological translation and not overanalyze something that couldn't be perceived by the typical viewer of the time (Chion, 2012, p. 14). Such an attitude must be adopted with video games: emulation is not a preservation of every aspect of an apparatus, but it is still a convenient and accessible way to have an experience analogous to the one on the original system. This "second-hand" experience requires scholars to be aware of the technical and cultural differences between the two systems.

Even though new possibilities offered by emulation can be seen by some players as great improvements over the original version of the game, a researcher must see these modifications as obstacles for the understanding of the initial experience. The *Ogre Battle: March of the Black Queen* (Quest, 1993) example will help us understand how the emulated experience can be misleading.

Ogre Battle was a fairly rare game. Only 25,000 SNES cartridges were released in North America and none in Europe. It is difficult for today's collectors to gain an original cartridge. It is through emulation that most of today's gamers experienced the game and, therefore, that the game gained its actual fame. As *Ogre Battle* shows, a game can be preserved and highly accessible by emulation, but as such, it can also gain notoriety amongst contemporary players. Instead of only preserving traces of the original context of the game, it also needs a new layer of necessary contextualization. Estimating its eventual legacy should not elude this additional (and later) notoriety.

Most emulators offer a "save state" function, which allows the player to save a game anytime during gameplay. As such, they can disrupt the original difficulty experienced when playing a game. In *Ogre Battle*, the player controls a rebel army that seeks to overthrow an evil empire. Each time a city is taken by the player, the player can draw a tarot card, which will give the player some benefit or disadvantage depending on the card. With an emulator, however, the player can simply save a state before the card in drawn and, depending on the result, keep the card or reload the previous state to reject it instead. Moreover, each mission can last an hour or so, without any possibility to save the player's progress in the original game until a mission is over. These difficulties are completely lacking for those using an emulator.

Many emulators also give the option to fast forward a game, which completely changes the gaming experience, though it can be seen as an interesting feature. On the tactical map of *Ogre Battle*, units are moving very slowly and the game does not feature any accelerating function like the Creative Assembly's *Total War* series (2000–present) would offer later. When two squads meet, the resulting skirmish occurs automatically: the player can only choose a general tactic for its units, use a limited number of special skills, or retreat. The game was quite long with a lot of skirmishes occurring in each of the game's 25 main levels, accelerating the pace of the action at some points, making it more interesting. In many RPG games, say *Final Fantasy VI* (Square, 1994), this acceleration feature let players accumulate experience points easily, reducing the laborious and necessary “grinding” time to complete the game. The contemporary notoriety of some of these games could partially be increased by these new gameplay possibilities. The players can thus renegotiate what they see as a “fair” game, new possibilities being optional.

Since emulated games are now usually downloaded illegally, games do not have the same value as those that are purchased and players won’t bother to investigate a game in-depth when the first attempts at playing it are not judged as satisfying. In earlier times, a player would have to invest a sometimes substantial amount of money for a game, and would spend a lot more time to comprehend its game mechanics instead of simply abandoning it.

Understanding what *Ogre Battle*’s role is in video game history necessitates, first, to look at what the game was in 1993 on a SNES console and, second, to look at how emulation offered new convenient gameplay aspects and increased its fame. Along this line of thought, some genres have been more suitable for emulation than others, especially when emulators were less precise, and have gained an additional fame for retrogamers. For example, Japanese role-playing games’ turn-based mechanics do not need to be precise in real-time rendering and the keyboard could easily be used as a replacement of the console’s controllers to implement the player’s decisions without changing too much the original experience. Another example of the new layer of contextualization that emulation brings is the possibility for fan communities to translate games to other languages and offer them a parallel distribution. By hacking the original ROM (read-only memory) files, fans will translate, usually, Japanese games into English. Some games are only accessible for an English-speaking player through fan translation: such is the case for *Mother 3* (Nintendo, 1996), even though the second game from this series was released in North America under the name of *Earthbound* (Nintendo, [1994] 1995) (Pelletier-Gagnon, 2012, p. 76). *Final Fantasy V* (Square, 1992) was never released for SNES outside Japan. Before its release within *Final Fantasy Anthology* for PlayStation in 1999, English translations of the original ROM file were already distributed online by amateur translators. It is therefore difficult, for example, to estimate to which extent these games contributed to the legacy of their genre or series for North American players since there is no clear trace of this underground circulation.

Hacking ROM files also leads to game creation; through emulators, game designers can program games as if they were running on older systems. As Byuu underlines, the problem is that some newly-created games relied on specific emulator imperfections and were unplayable with other ones (Kuchera, 2011, p. 1).

Conclusion

Using emulation as an archiving tool and for the study of video games necessitates different ways to contextualize games, their production process, and the way they are played. James Newman and Iain Simons from the National Videogames Archive in United Kingdom suggested that, instead of trying to preserve everything related to a game, the priority should be to interpret any available source. Preserving games or documents of game production is not meaningful for them if something explaining the context of games and documents is not added (Newman & Simons, 2009, p. 5). It is also the attitude suggested by Henry Lowood. As part of a history of video games where the “relationship between hardware, code, use and context for use” (Lowood, 2004, p. 4) is central, emulation is crucial but not the sole tool to make sure we still have traces of older gaming experiences.

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5

INTERFACE

Vincent Mauger

In the object universe of technology, game interface design began as an offshoot of video game development. It remained far removed from the constellations of design research, evolving on its own. Even in the flourishing field of game studies, key design aspects are ignored or belittled, just as video games are by the design study community, being, for them, a mere grain of sand on the beach of design culture. To bridge this gap, video game interface design will be examined here from a designerly techno-historical perspective.

To start with, the primordial role of the game interface is, just like any other interface, to enable information to be provided, accessed, and applied. Acting like a translator, the interface mediates between two parties, making one sensible to the other in a semantic relationship. Interaction happens through this shared boundary where the user wanting to fulfill a certain task meets the artifact or product enabling them to perform that task; that is, where the player meets the game: through game boards and playing pieces, playfields, screens, joysticks, keypads, and controllers; notwithstanding that today, most video games involve users via screen-based graphical user interfaces (GUIs) that are increasingly mobile, portable, and pervasive. Although their design intricacies are not obvious to the viewer, user, or player from the outside, interface design goes far beyond this external appearance and its *layout*: the graphic design establishing the arrangement, proportions, and relationship between the individual elements on the page or screen.

Lacking hindsight, it is common throughout the game industry to view the interface as detached from the game's graphics, bounded with clear beginning and end. This makes the defining of the task easier and the direct application of traditional interface design concepts possible. However, these practices may hinder innovation and experimentation with dynamic game interface elements that enhance gameplay experience, as interface designers are lured into the false security of customary static or passive constituents, such as visual frame or timer, life bar, and ammunition count. The design team behind *Dead Space* (Visceral Games, 2008) did not take this easy way out: their keen interface conveys information through intradiegetic elements such as floating holographic projections and an integrated health meter onto the spine of the protagonist's spacesuit.

Not surprisingly, the development of such visual and special effects has had an important interface application: instead of using text or icons, graphics can communicate information to the player. It explains why the great game studios understood years ago that putting aside an interface design assignment was not the brightest move. For example, the *Unreal Tournament* (Epic Games, 1999) team developed the game's engine with UnrealEd, which used a windowing interface written in Visual Basic (VB). In addition to being old and fragile, only one team member knew and cared about VB. Inevitably, bugs plagued the team while nobody had the time or inclination to fix them (Reinhart, 2003, p. 102). Technology choices may also eclipse the recognition of the great job artists and designers do, as happened with *Diablo II* (Blizzard Entertainment, 2000). Players frequently labeled the game's graphics as "outdated" or "pixilated," catching the team by surprise (Schaefer, 2003, pp. 87–88). The moral of this is that most players will immediately notice a poor visual quality. Likewise, a new game released from an obscure studio will hardly ever receive positive reviews if its graphical interface looks botched, even if the gameplay itself is astonishing.

The more relevant aspect of game interface design is its *functionality*: "that form ever follows function. *This is the law*" (Sullivan, 1896, p. 5), claimed the Modernist architects; though the main purpose of a game interface is always to allow players to interact with the game software. As many counter-examples demonstrate, a poor interface may ruin a video game experience. However, an aesthetic and easy-to-use game interface with a neat visual design can significantly enhance play experience. As for screen design, the organization of information and interactive elements on screen-based interfaces, animation, and motion design are also some of the interface designer's greatest assets, which aid in the addressing of standard graphic design concerns such as composition, page layout, color usage, and the creation and use of typography and icons. Nevertheless, before entering into the details of game interface design practice, let's look at its origins.

Making Interaction with Information Possible

The visionary Vannevar Bush, with the publication of his essay "As we may think" (1945), laid the foundations for hypertext with "trails of interest" built into the hypothetical Memex (standing for *memory index* or *extender*). He also introduced a major interface design metaphor: by using an ordinary desk as a document administration device, he envisioned the digital desktop.

Other pathbreakers such as Ivan Sutherland (1963) soon experimented with pixelbased displays, paving the way for future raster-based editing programs such as MacPaint (1984) or Photoshop (1990). Yet, it was on December 9, 1968 that Douglas Engelbart presented the demonstration that would define the modern computer interface. His breakthrough was the new paradigm of "direct manipulation" (Shneiderman, 1983), a way to give the user control over displayed text and windows. The multiconsole display used Engelbart's new tool, the "mouse," which served as the user's representative in dataspace and still remains the standard way to intuitively and directly access abstract information displayed on a monitor.

In the 1970s, at the Xerox Palo Alto Research Center, Alan Kay continued the struggle to transform the arcane command-driven modes into a genuine GUI, consisting of layers of windows based on real-world metaphors such as sheets and arrows. The WIMP paradigm (windows, icons, menus, and pointers) was born. As Sutherland and Engelbart helped equip the computer with *space*, Kay gave it *depth*, thus bringing the whole idea of imagining the computer as an environment or virtual world (Johnson, 1997, p. 47). But the power of this metaphor was too strong to remain trapped in a lab.

Around the beginning of the 1980s, a co-founder of Apple Computer, the far-sighted Steven

Paul Jobs, was searching for the technological advance that would revolutionize personal computing. He found what he was looking for at PARC in an experimental operating system called Smalltalk. After years of development, Apple released the Macintosh in 1984, along with a masterfully planned commercial spot—played once during the Super Bowl broadcast—casting IBM as George Orwell's Big Brother. Corporate DOS snobs that rebuked the GUI as a child's toy or a video game opposed the playful character and "look-and-feel" popularized by Mac advocates and were soon engaged in an aesthetic conflict alongside the nascent Microsoft Windows; its mere name confirmed the superiority of the new paradigm. To a certain extent, these battles over desktop usage and platform superiority, that continue these days in the video game community, have by a strange blow dealt by fate improved our grasp over digital spaces.

Correlated and Intricate Interface Design Practices

Increased digitization and interactive media development made information one of the most important resources for the interface designer. Designing interfaces as access points to digital information, where the link between the user and the digital application contains a level of feedback such as responses to user's command, communication, or selection, brings forth particular experiences. Interface design concerns user interactions in a wide array of contexts, such as video gaming, to achieve an optimal user interface. Every time players communicate a decision, the system offers new criteria for any new decision players might make within its architecture. There are no objective criteria available to help guarantee this delicate equilibrium. This is precisely where interface design practice comes in, constantly formulating and anticipating future uses. However, different scopes for design practices involve the machines and applications surrounding us.

Information design is "the translating [of] complex, unorganized, or unstructured data into valuable, meaningful information" (STC, 2012). "Information architect," a term coined by Richard Saul Wurman (Wurman & Bradford, 1997), was first used to describe the designer who structured inherent patterns into data in order to display complex information as clearly as possible so others could find it. Accordingly, information designers are thus facilitators defining the options for different information spaces. Since information now reacts dynamically to the way it is used through context-related suggestions, developing the core of an interface requires a dialogue between interface designer, interaction designer, engineers, and users. Interaction with information requires information design to be integrated with interface design.

Interaction design is "focusing on the fit between human actions and system responses" (Murray, 2012, p. 10) and determines what is brought into motion in relation to the user over time. It describes the use of the interactive product, and thus makes possible content manipulation and the users' navigation through it, via a choice of appearances or adaptive interfaces that can be customized according to users' interest and their level of knowledge. These interactions, between humans and artifacts, are the main research interest in the fields of human–computer interaction and man–machine interaction (MMI). This results in products that have a multitude of operability and usability requirements. These domains relate to diverse aspects such as cognition, perception, semantics, ergonomics, usability, and quality experience.

Interaction flow thus implies movement through and navigation of a hierarchical structure in which decisions are made, using the linked elements of a digital appliance or hypermedium. One crucial task when planning dramas and dialogue sequences is defining how information can be conveyed at the navigation metalevel, so that the navigation itself already incorporates formerly chosen content. In video game development, the management and structuring of this kind of information is often referred to as “narrative design” and the elaboration of the contents itself, “game writing” (see Mauger, 2012a).

These interrelations explain, on the one hand, why interface, information, and interaction design are often used together to describe an original design concept (to see 67 examples: IIDj, 2005) or unified into design processes and theories such as *information interaction design* (Shedroff, 2000). On the other hand, digital media scholar Janet Murray has called attention to the fact that interface is a “useful term, though misleading as the focus of digital design since interaction design is more inclusive and has supplanted it as a description of professional practice” (2012, p. 426). Indeed, many designers of the sensorial design disciplines have long worked to make products more “usable,” or been brought in at the end of design processes to make them more “user-friendly.” “This model has been replaced by a more inclusive design process and a focus on the interaction between the human being and the automated system” (Murray, 2012, p. 10).

Discourse concerning *experience design* (Laurel, 1990, 1991; Shedroff, 2001) or *flow* (Csikszentmihalyi, 1990) also had a major effect on interface design. According to Nathan Shedroff, interface design “is only one of the many terms used to describe the design of experience.” Thus, we could consider interface design “as encompassing information design, interaction design, and some forms of sensorial design (mostly visual and auditory design, since most computers can only display sights and sounds)” (2001, p. 109).

Interface Design and Game Studies

In 2000, designer Chuck Clanton (p. 301) pointed out that interface designers and game designers were two isolated design communities. He suspected that hardly any software designers attend game design conferences, and that few game designers know much about the human–computer interface (dubiously acronymed as “HCI”) design community:

> Almost every game I play has one or more flaws that HCI designers know how to remedy. Yet, I suspect that few HCI designers could design a great game. Likewise, few software applications show any awareness of techniques of game design that could make them easier and more fun to learn and use.

At that time, the human–computer interaction community had already observed empirical evidence about the value of user testing and iterative design, but these techniques were still meeting some resistance in “serious” software companies. Ironically, playtesting—paired with quality assurance testing—was a well-accepted technique used during video game development. Today, most game designers expect the quality of a game to improve as the design evolves during prototyping, playtesting, and revising (Fullerton, 2008). It can be argued than it is playtesting, not HCI expertise, that eliminates the most crippling user interface mistakes.

The ways a game designer accounts for the user within the design of a video game involves a much deeper and riskier process than that which occurs during the design of utility software products, because making gameplay “fun” is far more intractable to analysis than is productivity. “In software application design, … if the user interface is demonstrably bad, but the functionality is valuable, the product may well succeed, as many major software applications attest. Game design is more brutal” (Clanton, 2000, pp. 333–334).

As an elusive quality and a by-product of the imagination, the experience of fun is still in need of measurement methods to grasp the likelihood of its success. At the same time, few “serious” software businesses give expert attention to the challenges that face a user, or the awareness of the user’s need for variety, pacing, and purpose. Difficulty might be a driving force for players: it is not an enemy, but a friend to be sought, pampered, and brought into shape. Without it, no sense of accomplishment can arise. An important aspect of video games is qualified as “hardcore” by gamers and the specialized press. Given a steep difficulty curve, such games, from the classic *Rogue: Exploring the Dungeons of Doom* (Artificial Intelligence Design, 1980) to *Demon’s Soul* (From Software, 2009) seem “harsh at first glance” (Mauger, 2012b) and require players to adapt, given the efforts necessary over time to develop mastery, a phenomenon described by Torben Grodal as an *aesthetic of repetition* (2003, p. 148). However, there are many other traits characterizing video game interface design practice.

Video Game Interface Design Specificities and Distinctive Goals

Similar to those who work with other digital and hypermedia applications, video game developers juggle many technical requirements such as file sizes, disk space, load time, file compression, or online content. Although video game players often interact with buttons, sliders, menus, and other traditional components of graphical user interfaces, video game interface design uses concepts specific to the game industry, involving a particular design practice with its own characteristics, which intends to channel the unique experience of game playing.

The diversity of manual interfaces that provide players control of a game goes far beyond the usual keyboard and mouse duo. Console controllers, besides action buttons, analog joysticks, and directional pads, may have numerous triggers, rumble devices, additional speakers, touch screens, and motion-capture technologies. Specialized hardware such as mock weapons or musical instruments, a steering wheel coupled with pedals, dance pads, and other devices may help reinforce the feel of a game. Keeping in mind that more controllers means more interfaces, video game interface development certainly has a promising future ahead.

Perspective and camera controls are key elements in video game interface design. Specific choices of camera angles may convey affect just like a game system grabbing control over the camera may create drama, but at a cost: freedom. Cuts also eliminate the traversal of time. These creative choices may impact overarching game design decisions and precise interface design characteristics. Letting the player choose between perspective options such as a first-person, third-person, or isometric point of view, split screens, and restricted or hybrid views, will inevitably define gameplay elements and generic aspects of a game. This characteristic, closely tied to the actual potential for interactivity, is one that distinguishes the video game medium from other audiovisual media.

Game styles and genre conventions, as cultural frames and cognitive schemas, have an influence of the design because of the habits of players or designers themselves. These shape aspects of the game systems over which players must have control, as it becomes difficult to change design schemata once conventions are deeply rooted. Specific elements are closely related to players' goals and tasks, such as a system of rules, strategic depth, the number of units or characters under the player's command, communication and trading tools, maps and quest journals, as well as the absence, presence, and control over dialogues or character developments.

In 2000, Nathan Shedroff suggested a way to consider interactivity by picturing all experiences and products as inhabiting a continuum. The way to determine a value judgment about an experience's respective position in this continuum was to assert a certain level of interactivity. Two elementary spectra were identified according to the achievement of the experience's goals: control and feedback (pp. 283–284). Game designers Kevin Saunders and Jeannie Novak follow a similar trail, claiming that a game's interface has the same two primary goals: control over what happens through the inputting of information into the game, and feedback through information received from the game (2007, p. 20). All elements in an interface should take part in larger schemes that empower or inform players, furthering at least one of these goals. Feedback should indicate short-term and long-term progress toward game goals, by teaching players new concepts through direct or implicit instructions, enabling them to develop strategies, or allowing them to perceive duration and degrees of success. Secondary goals also apply to games. Saunders and Novak also mention *immersion,* a psychological state that "makes players forget they are playing a game" (2007, p. 26). This psychological state could be encouraged by more transparent interfaces such as those used for *Peter Jackson's King Kong: The Official Game of the Movie* (Ubisoft, 2005) or *ICO* (Team Ico, 2001), in which no GUI has objects that are displayed as icons on the screen. Instead, interfaces are well-integrated into the diegesis. Still according to Saunders and Novak, an "*atmosphere*" may also be achieved when the interface is consistent with the nature of the game played, such as the light gun used for simulation in *Duck Hunt* (Nintendo, 1984).

This vague conception of immersion refers to various mechanisms related to different immersion types such as *sensory, fictional*, or *systemic* ones (Arsenault, 2005). It may also refer to the two strategies of visual representation behind the concept of remediation. Bolter and Grusin (2000) describe the phenomenon of reproducing conventions, content, or both from one medium to another: *immediacy* (or *transparent immediacy*) "whose goal is to make viewer forget the presence of the medium (canvas, photographic film, cinema, and so on) and believe that he is in the presence of the objects or representation" and *hypermediacy* "whose goal is to remind the viewer of the medium" (pp. 272–273). A hypermediated game interface such as the one portrayed in the massively multiplayer space simulation *Eve Online* (CCP Games, 2003) may make the buttons, menus, motions, or artistic elements of the GUI the focal point, instead of game contents such as actions, graphics, rules, or narrative information, which can be counterintuitive. The interface should never demand more attention than the gameplay itself. Deep immersion within a game will only start after a user is no longer conscious of the interface during the decision-making processes within the experience of play.

Game Design and Interface Design: Planning for the Game's Completion

According to game project manager and art director Brent Fox (2005, p. 10), if game designers create games with goals that are clear and then communicate them clearly to the development team, the design of the interface will be easier. Breaking a general goal into specifics is the idea behind this simple approach. "The point is to define useful goals that will provide direction during development" (2005, p. 12), so that interface planning may help game design. A solid game proposal thus helps the planning of an interface, which will result in an interface design document usually summarized as part of a larger game design document. This also explains why the interface is the one of the first elements needed in a game project, and one of the last ones that can be tested for usability.

As in any other design project, planning and documentation are an essential for the development of a successful interface. The luxury of free experimentation may be possible in a large-budget production, but with a smaller budget, in which your own investment may be at stake, you need to get it right early on. Even if it sounds paradoxical, to complete an interface design quickly, *more* time needs to spent planning: it is the heart of design; the ground from where the project will take root. Defining the schedules, screens, and artwork used or re-used, and the information displayed in the video game, are tasks that need to be done in the planning stage, through the generation of asset lists.

Let's keep in mind that the making of the assets used in a typical game interface usually requires much less effort than the development of engines, 3-D models, and animations sequences. For that reason, it is worthwhile to expend the right amount of time and energy to properly design an interface's aesthetics. For example, the thematized visual interfaces in the game *StarCraft* (Blizzard, 1998), playing the minor dual role of guide and ambience beacon in this franchise, could encourage identification with the race the player has chosen to play.

In a perfect world, the design method would be immutable, allowing a game to be perfectly planned in advance. However, the iterative nature of the game design process—analyze, design, test, then repeat (Zimmermann, 2003, p. 177)—until "satisficing" (Simon, 1956, p. 136; 1969) guarantees that some changes will be necessary. Without meticulous planning, even the most inspired concepts, such as those in *Age of Empire* (Microsoft, 1997), *Thief: The Dark Project* (Looking Glass Studio, 1998), *System Shock 2* (Electronic Arts, 1999), and *Black & White* (Electronic Arts, 2001), did not pass the test of concrete expression without any changes (see Grossman, 2003).

Ingenuity and time must do their work. A beginner's trap is to use the time allowed for this process (usually scheduled by any skilled project manager) to continue the ideation phase. This procrastination of the actual realization of the design will often leave a budding designer trying to justify an incomplete work when the deadline comes. To build a solid core is essential: one must only include, assiduously, additions that are useful, meaningful, and justified.

This behavior will seem fairly natural to game designers. It also clarifies why good interface planning and design normally help game design by directing attention to technical issues that would otherwise have been considered later in the video game development. For example, crafting a heads-up display calls forth gameplay decisions. Or a simple screen menu where the player may click on an environment icon triggers many questions: Will the player be able to choose between different environments? How many levels? Will some be locked until certain tasks are completed? Is there only one precise order that must be followed, or are many other ones possible? Will those choices be affected by gameplay? And so forth.

It is worth mentioning that the particular menu system that appears before a game really starts and allows gameplay is often referred to as the *front-end*. It must be distinguished from the in-game interface and the pause menu in the game. To plan and organize those menus, the creation of different flow charts is the best way to organize ideas. In game design classes, adding this clear and simple division to assignments improves a project's quality overall, as well as students' comprehension about flowcharting and interface design.

After sketching and flowcharting, the next step is to use a vector editor (such as Illustrator or Inkscape) or a diagramming application (such as Visio or Omnigraffle) that includes the option of printing on multiple pages and creating one big chart. This allows one to trace and adjust arrows and windows that will show the interaction flows of the interface through site maps, flowcharts, wireframes, and screen designs (see Brown, 2007).

The Many Shapes of Things to Come

Even if layers of documents are still presented in windows, data still deleted by dropping it in the trash, and digital documents still archived in files, every day these metaphors lose more and more of their transferability. A single folder can't support a vast number of subfolders and sub-subfolders, and disks and storage media are not dropped into a wastebasket. For the sake of digital media advancement, new metaphors will inevitably emerge.

In an opposite direction, physical space itself is becoming the domain of digital experience, as a result of new technologies and interactive systems. Mediated, mixed, and augmented reality open brave new hybrid worlds for digital exploration. Interactions with portable equipment, such as smartphones, computer tablets, or handheld game consoles, offer many possibilities just as the various application of a person's movement, position, and articulation in space is captured by peripherals through motion capture, "the process of capturing and recording movements from a real, physical actor or element and then using the translated data to control a digital model" (Mauger, 2012c, p. 421).

The steady stream of new inventions implies that video games are limitless, as display technologies progress beyond standard monitors and displays, and when almost any surface can function as a projection screen for information. For better or worse, interfaces will continue to grab our imagination through their efficient illusions and our suspended disbelief.

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6

PLATFORMS

Bobby Schweizer

Whether hardware or software, platforms are “an abstraction” or “simply a standard or specification” that makes it easier to build other things (Bogost & Montfort, 2007, p. 2). While a formal discipline for studying platforms has only emerged recently, the idea of standardized sets of things enabling games has earlier roots. Ron Hale-Evans (2001) referred to a deck of playing cards as a “game system” because it was “a set of components that function together in multiple games.” In a series of articles, Evans studied board games that enabled variation to demonstrate that a “game system is less an individual work than an actual medium” (2001).

As related to computation and video games, “a platform is a computing system of any sort upon which further computing development can be done” (Bogost & Montfort, 2009, p. 2). Platforms exist at all different scales and levels of materiality. Most closely related to games are programmable platforms. A microprocessor is a programmable chip that governs low-level functions of a computing system. An operating system is a level of abstraction that determines how applications interface with each other and the user. A 3-D game engine acts as a tool for developers to model figures, lighting, and camera movement. A GPS-equipped mobile phone enables location-based interaction.

Colloquially, the term “platform,” in relation to gaming, has been used to refer to both the hardware and software systems that run a game. The Super Famicom/Nintendo (1990 JP, 1991 NA), Apple][(1977), Microsoft’s Windows 3.11 (1993), Google’s Android 2.2 Froyo (2010), and the Wonderswan Color (2000) are all kinds of platforms (author note: platforms/games first released in Japan are noted by the year followed by JP, with the North American year denoted as NA). But these categories alone capture only a fraction of the processes in place that influence how games and software are made because they are themselves built from other platforms. Understanding video game platforms requires examining the building blocks that shape the output of creative work.

Specifications for platforms influence rather than determine. Recognizing the opening for criticism of a method of study that focuses on the artifact rather than the creator, Bogost and Montfort explicitly state that “[p]latform studies is opposed to ‘hard’ determinism and invites us to continue to open the black box of technology in productive ways” (2009, p. 1). Platforms refer to the whole ecosystem in which an artifact exists. “Platforms are layered—from hardware through operating system and into other software layers—and they relate to modular components, such as optional controllers and cards” (Bogost & Montfort, 2007, p. 1).

Because they are interconnected, an observation about a game or technology—like the kinds of innovation realized or unrealized in eBooks through Apple’s store—cannot have a single determining factor. “The iPad iBooks platform is the sum total of its layered components—from microchips to the multitouch interface, to the available software, to the publishing channel for that software (the actual e-books), and its reception by users” (Jones & Thiruvathukal, 2012, p. 11). So while the publishing software provided by Apple for publishing eBooks may contain specifications for embedding multimedia content, there are a multitude of reasons why an eBook read on the iPad still resembles its static e-Ink cousin. The multimedia interactive standouts of the eBook world, on the other hand, were produced by people who understood the capabilities of the software as enabled by the hardware. In this scenario, the specification that describes what pinch-to-zoom should do is as important as the Apple A4 system-on-a-chip processor that drives the iPad.

There is contention as to the purpose of platforms. Bogost and Montfort address a criticism of the computational focus of platform studies as they quote communication scholar Tarleton Gillespie describing software engineer and businessman Marc Andreessen’s position: “Platforms are platforms not necessarily because they allow code to be written or run, but because they afford an opportunity to communicate, interact, or sell” (Bogost & Montfort, 2009, p. 3). They contend, however, that the computational nature of platforms remains the underpinning even when outside factors are introduced.

Platforms can be studied to draw insights into both narrow and broad aspects of games and gaming technology. They raise issues of similarity and difference. Commodore 64 (1982) games have something in common with each other while also demonstrating how creative programmers can differentiate their work through varied approaches. Platforms also exhibit difference in terms of audience. In *The Future Was Here*, Maher addresses the Commodore Amiga’s (1985) wide appeal: “I explain the ways in which the machine’s technical qualities made it useful or even ideal for various purposes and how engineers programmers, artists, and others harnessed these qualities to push back boundaries and transform the culture of computing” (2012, p. 8). It is not just the capabilities of the system but also how those who do something with it approach them.

The Platforms of Video Games

Specific examples help illustrate the influence of platforms on the creative output of the gaming industry. Montfort and Bogost (2009) turn to the Atari Video Computer System (VCS) (1977) as the first subject of analysis for the discipline of platform studies. They consider how the VCS is able to store and recall information from memory in the Motorola 6507 microprocessor, how it draws images to the television using its unique Television Interface Adapter, the costs and benefits of read-only memory game cartridges, and what it meant to adapt an arcade game to a significantly inferior living room technology.

Examining platforms unearths details that go unconsidered in popular analyses. The Atari VCS produced a unique visual style across its games, notably through the shape of objects on the screen. One of the distinct aesthetic qualities of VCS games is their long rectangular figures: everything on the screen (to today’s eyes) looks stretched horizontally. This was directly the result of the process by which the Television Interface Adapter (TIA) drew to the screen. The modern fundamental pixel is square in shape, but the Television Interface Adapter’s pixels were based on the horizontal length of a scan line and the vertical height of a color clock (Montfort &

Bogost, 2009, p. 29). Because these two, as a matter of how televisions work, are equal, the aspect ratio of any pixel is actually a rectangle. The rectangular quality of VCS sprites was readily apparent in the port of *Pac-Man* (Atari, Inc., 1982). Because of the size and aspect ratio of the scan lines, it is difficult to produce round shapes. In the VCS port, a flat-headed Pac-Man moved its way through a maze collecting dashes rather than dots.

Platform Categories

There are a few major categories of platforms worth considering when describing games and game hardware.

Microprocessors, the computational foundation of any computing system, are a good starting point for examining the capabilities of hardware. As the foundation, however, they are often the most difficult to comprehend. Earlier chips, such as the 8-bit MOS Technology 6502 used in the Apple][, Commodore VIC-20 (1981), and Famicom/Nintendo Entertainment System (NES) (1983 JP, 1985 NA) are perhaps more legible than today's 64-bit Intel Core i7 chip that powers high-end consumer desktop computers, but in both cases it's possible to recognize the capabilities of each. Most generically, a processor might say something about the speed at which hardware can run software and what kind of software it is capable of running. The clock cycles of a microprocessor are a limited resource and, whether directly or indirectly, developers must consider the computing power available to them.

Graphics processors determine the visual output of the system. Nintendo's "Picture Processing Unit" Ricoh microprocessor governed the number of sprites that could be simultaneously drawn to the screen, the NES's color capabilities, separate movement of foregrounds and backgrounds, and horizontal and vertical screen scrolling. While Mario was able to run in a side-scrolling environment on the NES, the PCs of the day were not built with this function in mind. Programming a tech demo of a PC port of *Super Mario Bros. 3* (Nintendo EAD, 1988 JP, 1990 NA), id co-founder John Carmack had to innovate a method for simulating side-scrolling that was capable of running on the variety of graphics hardware available in the market (Kushner, 2003, pp. 49–50). Facing the problem that the graphics processor was designed to redraw every pixel on the screen as it refreshed, "Carmack wrote some code that duped the computer into thinking that, for example, the seventh tile from the left was in fact the first tile on the screen" (Kushner, 2003, p. 49). Understanding the issue Carmack faced at a technical level helps distinguish the kinds of games available on the PCs of the era versus the NES. Graphics processors have far-ranging implications because of the visual primacy of video games. As a product of varying fidelities, video games have developed their own semiotics. The little square of *Adventure* (Atari, Inc., 1979) is understood to represent a person, even if it makes no attempt to depict the appendages of a human body.

Storage media, too, have an effect on creative output. For the Nintendo 64 (1996), Nintendo stuck with the faster-loading, more expensive plastic cartridges instead of the slow, cheaper optical discs Sony had adopted for the PlayStation (1994 JP, 1995 NA) (Kent, 2001, p. 511). CD-ROMs, meanwhile, have the advantage of being able to store large amounts of data and media such as full-motion video and recorded music. When Microsoft was developing the Xbox (2001), the high-capacity DVD format was leveraged as a place to store operating system modules for each game to slim down the version of Windows NT that actually resided inside of the Xbox hardware. Similarly, Nintendo's research and development teams in the 1980s innovated with its second generation UNROM cartridge, which ran on the same NES hardware but was able to increase its read-only memory and perform bank-switching with the addition of a RAM chip (Sheff, 1999, p. 42).

Sound processors have largely gone ignored since the advent of optical media enabled the replay of digitized music. CDs, DVDs, and Blu-ray discs can contain fully orchestrated scores, licensed music from popular culture, and tracks composed in MIDI synthesizers and digital music software. Earlier hardware, on the other hand, used hardware sound chips that had to be programmed to be used for audio composition. The Sega Genesis' Yamaha YM 2612 (1988 JP, 1989 NA), for example, was capable of six channels of digitized stereo FM synthesized sound (Collins, 2008, p. 40). Audio developers had to create algorithms in assembly code to produce a library of sound effects, samples, and instruments that composers could then work with. An understanding of audio hardware technology helps to explain not only the music and sound effects of a single game but also the distinguishing audio profile of a hardware platform. Beyond music and sound effects, audio technology can also have an effect on the experience of playing a game such as the bassy thump of the space invaders marching across and down the screen. Similarly, large subwoofers were installed as part of racing game cabinets in arcades to produce deep engine sounds and guttural noise (Collins, 2008, p. 177).

Controllers, as the primary interface between player and game, are a significant platform. The number of buttons on a controller determines how many actions a game can reasonably employ, which affects the kinds of games that can be made. The two primary buttons (B and A) on an NES controller were usually mapped to two different actions that made up the core gameplay (often jumping and attacking). While the Start button was most often assigned to a pause screen, the Select button could have alternative functions such as cycling through an inventory of weapons such as the missile types of *Metroid* (Nintendo R&D1, 1986 JP, 1987 NA) or transforming Trevor Belmont into one of the alternative spirit characters in *Castlevania 3* (Konami, 1989 JP, 1990 NA). Beyond numbers of buttons, other important considerations for controllers are digital input versus analog input, the placement of buttons and sticks and how the controller is expected to be held, the different fidelities of mouse versus joystick pointing, and features such as vibration. Alternative controllers—such as the plastic instruments of *Rock Band* (Harmonix, 2007) or full-body input of the Microsoft Kinect (2010)—should also be considered for the capabilities they enhance or limit.

Game engines are software that handle various technical aspects of games' functions such that developers need not code their entire work from scratch. A game engine might handle how objects move, how collisions work, the function of menus, user interfaces, saving and loading, text, music, networking protocols that make it multiplayer locally or online, and other foundational components of games. Flixel, for example, is a library that enables game development in Actionscript 3 with code for moving objects, handling input, creating tilemap levels, and basic artificial intelligence functions such as pathfinding and following. There are also specific types of engines that handle specialized domains. *Graphics engines* are used for drawing to the screen, 3-D models and textures, camera movement, and lighting. A *physics engine* governs how objects respond to rules of physics such as a car driving on rough terrain, a body being thrown from an explosion, or the way a stack of blocks falls when struck by a ball.

Havok is a popular example that has been used in games such as *Uncharted 3: Drake's Deception* (Naughty Dog, 2011), *StarCraft II: Wings of Liberty* (Blizzard Entertainment, 2010), and *The Elder Scrolls V: Skyrim* (Bethesda Game Studios, 2011). Major game engines, such as Unreal Engine 3 by Epic Games, can handle not only the basic functions of a game but physics and graphics as well. When considering the Unreal Engine as a platform it's important to note that it can be used differently depending on the hardware and software platforms. Though built on the same code, the Unreal Engine that runs *Gears of War* (Epic Games, 2006) on the Xbox 360 is used differently from the one that has been used for *Infinity Blade* (Epic Games, 2010) for Apple iOS.

Middleware, like a game engine, is software written to handle certain functions of games. But unlike other engines, middleware encompasses the things developers put inside of games. SpeedTree, for example, is software by Interactive Data Visualization, Inc. that generates and animates foliage in real-time. A game developer can license SpeedTree for use in their game so as not to spend time worrying about how the leafy landscape is drawn. Middleware might be used to handle things such as artificial intelligence, sound, video playback, crowd dynamics, and character animation. It differs from game engines in that it is most often suited for a single specific task.

Application programming interfaces, better known as APIs, are another type of platform. While their effects are not as immediately apparent, they control access to data and interactions with a software system. Not only is Sony's PlayStation 3 an assemblage of hardware and an operating system, it is also a set of codes that determines how developers can interact with even the most basic functions. Graphics systems such as OpenGL and DirectX are also APIs. Marc Andreessen generalizes platforms into APIs in his 2007 article on "The Three Kinds of Platforms You Meet on the Internet." His three levels are "access APIs" that are provided by first parties to third-party developers to create applications, "plug-in APIs" that allow third-party software to run inside the primary platform, and runtime environments that run on top of the platform. For Andreessen, APIs give access to platforms. But the API itself can also be thought of as a platform because of this. Another important consideration for APIs is in instances where developers gain access to functions of hardware or software outside of official channels through hacks and exploits.

Cross-platform is a term used to describe software that runs on a variety of dissimilar hardware. A game that plays on both the PlayStation 3 (2006) and Xbox 360 (2005) is often called cross-platform because the output of the two pieces of hardware produces seemingly identical results. But differences in the two—issues of frame rates, loading times, graphical quality, and multiplayer features—reveal the unequal underpinnings. But some platforms are built with specifications for other platforms to run them. Software environments can be treated as platforms, as is "certainly the case when digital media work is done in Java and Flash, systems that were designed to work similarly across different hardware platforms" (Bogost & Montfort, 2009). A game that runs on the Android mobile operating system—which may exist on any number of kinds of hardware—emphasizes the complexities of platforms. Is *Angry Birds* (Rovio, 2009) on the Samsung Galaxy Tab (2010) the same game on the Barnes & Noble NOOK Color 2010)? Doing the work of platform studies resolves these issues.

Platform Studies

Knowing how platforms are implemented provides a tool for analyzing and exploring games. As a discipline created for the humanities, platform studies “has been established to promote the investigation of underlying computing systems and how they enable, constrain, shape, and support the creative work that is done on them” (Maher, 2012, p. ix). Looking at platforms is important because they help us understand the choices made during the development of an artifact, the outcome of which “is supported and constrained by what this platform can do” (Bogost & Montfort, 2007, p. 1). Rather than treating games as blank canvases of unlimited creative output, there are realistic material limitations that inform the kinds of decisions designers, programmers, artists, and others are able to make in the creation of a game. Perhaps most succinctly, “[p]latform studies connects technical details to culture” (Bogost & Montfort, 2009, p. 1).

The discipline of platform studies has evolved as a way of studying games that takes into account the technological and historical factors that influence production. Jones and Thiruvathukal write in the introduction to the Wii’s (2006) analysis in *Codename Revolution* (2012, p. 5):

> Platform studies is an approach that looks at the relation of hardware and software as a system from the electronics inside the console box to the peripheral controllers, and at how the affordances and constraints of a particular system invite as well as shape the development of creative works.

It is not a methodology but rather a set of approaches for understanding hardware and software as exemplified by the books in the platform studies series. In *Racing the Beam*, Montfort and Bogost (2009) address the Atari VCS not only by detailing its technical underpinnings, but also by examining six games that exemplify different aspects of the system. Maher in *The Future Was Here* (2012) takes a comprehensive approach that not only looks at hardware, but also the software of the Commodore Amiga and how it shaped the work of artist and programmers using the “world’s first true multimedia PC.” Alternatively, *Codename Revolution* (Jones & Thiruvathukal, 2012) breaks out of the serious hardware analysis to explore those factors that construct the Wii as a platform beyond its internal specifications.

What is the breadth of a platform studies endeavor? How deep must one go into a piece of hardware, an operating system, a software runtime environment, or a sound card? If the microprocessor that powered the Atari VCS was extremely complex, how is it possible to know the details of today’s modern CPUs? Bogost and Montfort suggest, “[s]uch a knowledge need not be of the same order as that of a computer scientist or electrical engineer” because “the new media scholar is aiming to understand technologies well enough to connect them to culture” (Bogost & Montfort, 2009, p. 5).

Platform studies is not just about explaining how something works but rather why the products of that platform exist in the way they do. The mission structure of *Grand Theft Auto: Vice City* (Rockstar North, 2002) most often keeps the player on either the east or west island because that is the amount of the world the developers were able to load into memory on the PlayStation 2. So while Rockstar North was able to use a certain amount of draw distance techniques in localized areas, the loading points on the bridges between islands represent the limits of what Rockstar was able to stream off the disc. These between-city loading screens disappeared in *Grand Theft Auto: San Andreas* (Rockstar North, 2004), since the greater distances between the regions provided more time for background loading. Knowing the processing capabilities of the PlayStation 2 hardware, how DVDs are read, how world geometry and textures can be drawn in real-time, and the ways in which the developer learned to take advantage of all these platform properties, can answer questions about the organization of missions and gameplay design.

Non-Technological Considerations

Technology is not the terminus of platforms. In "Platform Studies: Frequently Questioned Answers," Bogost and Montfort (2009) note that culture surrounds the interpretive layers of reception/operation, interface, form/function, code, and platform. Many of the influences of culture operate broadly, but others have discrete effects on the platform itself. This can be viewed from two perspectives: social protocols that determine how a platform is meant to be used and developed expectations that guide output based on past examples. In both cases, it is possible to point to forces that have been codified such that they are effectively specifications even if there is no mechanism for enforcing them at the level of code. As mentioned above, *Codename Revolution* examines the Wii as a "social platform," and discusses how this design principle guided both the hardware and the kinds of games developed for the system.

"Games, too, are produced, distributed, received, and played via a multilayered system of components, from hardware to software to economic and social institutions," write Jones and Thiruvathukal (2012, p. 11). As an example of non-technological factors, the authors of *Codename Revolution* explain how the discipline of the history of books includes not only study of printing technologies, but also the means of distribution and consumption, copyright laws, publishing ecologies, and the business of the book (Jones & Thiruvathukal, 2012, p. 32). The Wii should not just be seen as a box with technical specifications and controllers of a certain fidelity, but also an imperative to bring people together in the living room, to produce an object that engages physicality, to incorporate daily information such as news and weather into a home screen that would compel people to turn on the Wii for reasons other than playing a game, and to provide a distribution channel for Nintendo's library of classic games. Nintendo wanted a platform that transcended arguments about processing capabilities and graphical fidelities and that encouraged new kinds of interaction.

Platform studies, while often highly technical, embraces the importance of those who actually work with the technology. Maher writes in his introduction (2012, p. 8):

> My position here is certainly not one of strict technological determinisms, although the Amiga's hardware design made it remarkable, most of the credit for the vibrant, creative culture that sprang up around this platform must go to the people who saw the potential in the hardware and made it sing.

He continues, saying that the "unique spirit of creativity and innovation that surrounded the platform for years after that date are thus more a cultural than a technical phenomenon."

Platforms of all scopes give insight into the things of the gaming world. They can explain why the Commodore 64 has a certain color palette, why an NES game has a slow-down when too many enemies are on the screen, how physics works in *Portal* (Valve, 2007), the choice of different sound effects for the SEGA Genesis and Super Nintendo versions of *Aladdin* (1993, 1994), and why there are so many dancing games for the Kinect. They illuminate creative output —a force that is not unrestricted but rather enabled and constrained. Platforms give us a way of thinking about groups of things. They can address technological, cultural, and imaginative moments.

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7

RESOLUTION

Mark J. P. Wolf

The concept of resolution is used in all digital media, and is therefore applicable to video games. Resolution refers to the number of discrete and indivisible units (such as pixels, frames, available colors, polygons, or samples) used to represent (or resolve) a portion of an analog spectrum, in particular, those of space, time, color, geometry, or sound, respectively. Due to memory limitations, processing speed, and screen and speaker capabilities, these types of resolution are always limited in some way, requiring graphic designers, sound designers, and game designers to take them into consideration, especially in projects with more restrictive limitations regarding resolution. When there is insufficient resolution in any of these areas, some type of artifacting occurs, which disrupts the smoothness of the transitions between the discrete units involved, revealing the borders or gaps between them, which often disrupts continuity and calls attention to the lack of resolution. As such, attention to the boundaries of individual units is generally considered undesirable, since this usually results in what is considered a reduction in quality of the final output, requiring techniques to smooth over these gaps or boundaries and restore smoothness to the final output.

The first four types of resolution, spatial resolution, temporal resolution, color resolution, and geometric resolution, have to do with computer graphics. They can all be limited both by the way software is programmed as well as the capabilities of the hardware that the programs run on, although hardware limitations also place an upper bound on what can be done with software on any given system.

Spatial Resolution

Spatial resolution is measured in pixels per inch, and refers to the amount of detail possible in a digital image, which is made up of a grid of pixels (which is short for *picture elements*). The more spatial resolution an image has, the more it is capable of resolving small details. Standard resolutions of imaging devices include 640 × 480 pixels for standard NTSC television, and 1,920 × 1,080 pixels for full high-definition television. Some cameras, such as the Red One by Red Digital Cinema Camera Company, can produce digital images that are over 4,000 pixels across, but such images are still far less than what the human eye can perceive. Since the human eye is able to resolve around 0.3 minutes of arc, images produced by the eye, depending on conditions, are somewhere between 52 megapixels (McHugh, 2005) and 576 megapixels (Clark, 2005). The screens used by visual media devices, though, usually only occupy a portion of the eye's field of vision during viewing, and gestalt processes performed by the eye and brain also process and interpolate imagery, so images with resolution far lower than what the eye is capable of can still be used without attention being drawn to issues of resolution that would disrupt the viewer's contemplation of them.

The imaging device used by a video game, however, only presents an upper bound for resolution; processing power and software-related restrictions can also limit resolution, as in early home video games, such as those of the Atari VCS 2600, which used an NTSC television but had a resolution of only 320 × 192 pixels. Likewise, early home computer software had various graphics display standards that often did not use all the screen resolution offered by monitors. Prior to 1984, the CGA (Color Graphics Adaptor) standard, which allowed image resolutions of 320 × 200 pixels with a four-color palette (or 620 × 200 with a two-color palette), was used by DOS computers for graphic displays. Such harsh restrictions made representational imagery difficult, leading to the 1984 release of the EGA (Enhanced Graphics Adaptor) standard, which allowed image resolutions of 640 × 350 with 16 supported colors from a 64-color palette. In 1987, graphics improved again when IBM released the VGA (Video Graphics Array) standard with images of 640 × 480 pixels and a 256-color palette, which was later improved to the SVGA (Super Video Graphics Array) standard, with an image resolution of 800 × 600 pixels. Today, console-based games are also available for high-definition television monitors, and games with three-dimensional graphics can be scaled to a variety of resolutions, unlike two-dimensional games that were resolution-specific.

The lower an image's spatial resolution, the more apparent the edges of individual pixels will be, resulting in a jagged appearance referred to as *aliasing*. The effects of aliasing can be lessened by using rows of pixels of interpolated colors or tones at boundaries between different colors or tones, to make the transition between them more gradual; this process is called *anti-aliasing*. Various anti-aliasing algorithms use such things as subpixel rendering, the colors of neighboring pixels, and knowledge of the workings of the human visual perception system in order to determine the correct coloring of pixels for the reduction of aliasing.

Temporal Resolution

Temporal resolution refers to the number of frames per second (fps) used in time-based media. The more frames per second used in moving imagery, the smoother apparent motion can appear within the imagery. Filmmakers in the silent era discovered that 16 fps was the rate at which "flicker fusion" occurred; that is, the rate at which a projected image appears to be continuous rather than flickering, thus setting a lower bound for temporal resolution in moving image media. Sound film raised the rate to 24 fps (due the demands of sound technology) and some film formats use higher rates; for example, Showscan footage is shot and projected at 60 fps, giving its imagery a more realistic appearance, due to the lack of visible grain in the imagery.

For video games, however, the frame rate is determined by both hardware and software, similar to spatial resolution. While computer monitors usually have a frame rate of 30Hz or higher in order to produce a continuous image, the processor of the computer using the monitor may produce imagery at a lower frame rate, causing frames to be held on-screen longer than the screen's refresh rate; for example, the computer game *3D Monster Maze* (J. K. Greye Software, 1982) had a frame rate of only 6 fps, due to the demands it made on early systems. Other games that involve fast action require higher frame rates, often 30 fps or 60 fps. *Quake III Arena* (id Software, 1999) was designed to have a maximum frame rate of 125 fps, though processing demands and hardware limitations could slow the game down.

Temporal aliasing, known as *strobing*, occurs because a frame rate is too low to convey a sense of smooth motion, and moving objects appear to jump from one position to another rather than moving smoothly between them. The effects of strobing can be lessened through the use of *motion-blurring*, which simulates the blur that an object would have passing through a given span of space in a given span of time, all within a single image. The addition of motion blur to a moving object fills in the gaps between the object's positions from one frame to the next, smoothing the overall appearance of the motion. *Micro stuttering* is another type of temporal aliasing, found specifically in game systems that use more than one graphics processing unit (GPU) to produce their imagery. When multiple GPUs are producing imagery at slightly different rates, the result is disruption of smoothness, in which some images remain on-screen longer than others.

Color Resolution

Color resolution or depth (or in the case of grayscale imagery, tonal resolution or depth), is measured in bits per pixel (bpp), and refers to the number of colors available for use in an image or series of images (for n bits there are 2^n possibilities). Color resolution first depends on hardware capabilities that determine what range of colors can be displayed, and which set an upper bound for resolution. Most display systems are RGB-based, meaning that their colors are produced by combining red, green, and blue, each of which can occur at different levels depending on the resolution available. Within hardware limitations, color resolution is also determined by software programming, which determines the number of bpp that will be used. As mentioned above, different graphics standards had a range of color palettes, from black and white imagery (1 bpp) to a four-color palette (2 bpp), eight-color palette (3 bpp), 16-color palette (4 bpp), 64-color palette (6 bpp), 128-color palette (7 bpp), 256-color palette (8 bpp) and so on, to palettes with millions or billions of colors. By comparison, the human eye is said to be able to distinguish as many as ten million colors, though estimates vary widely (Judd and Wyszecki, 1975, p. 388).

When the color resolution of an image is low, the jump from one color to another along a gradient is more abrupt and noticeable, resulting in color aliasing or *mach banding*, also known as *posterization*. This can be alleviated through the use of *dithering*, in which pixels of different colors are mixed in changing ratios across the boundary between colored areas, allowing one color to increase while another decreases, simulating a gradient between different colors or tones when the image is viewed from a distance or if the spatial resolution is high enough. To get around color limitations, some games also use an *adaptive palette* that has a limited number of colors but changes what those colors are from one screen to another, depending on the needs of the scene being displayed. For example, the pre-rendered images used in *Myst* (Cyan, 1993) used a 256-color adaptive palette and dithering to smooth color gradients within a scene. By contrast, *Myst Masterpiece* (Cyan Worlds, 2000) had 24-bit color and did not need to rely on dithering. Some monitors are now capable of 48-bit color, which can produce 281.5 trillion colors, far beyond what the human eye can distinguish.

Geometric Resolution

Geometric resolution, when applied to three-dimensional graphics, refers to the number of polygons used to resolve a three-dimensional shape within a three-dimensional space. The more polygons used, the more curved surfaces can be approximated and accurately represented in an image. Geometric resolution, then, is measured by the number of polygons per second that a computer is able to render on-screen in real time. For example, the Nintendo 64 was able to render between 100,000 and 150,000 polygons per second, while the PlayStation 3 is said to be able to render 275 million polygons per second. While geometric resolution sets limitations on the modeling of three-dimensional objects, how realistic those objects appears also depends on such factors including color resolution, textures, lighting, and movement.

Low geometric resolution, in which the edges and vertices of individual polygons are discernible, results in a blocky or faceted appearance, whereas higher resolution allows for smoother curves and flowing forms. Naturally, simpler objects require fewer polygons, while more complex ones require more. One of the challenges of computer modeling is to represent the object being modeled with as few polygons as possible while still maintaining as realistic an appearance as possible. The geometric aliasing that occurs in low-resolution models can be aided by certain shading techniques, such as Gouraud shading or Phong shading, which apply color or tonal gradients across polygons so that their boundary colors match, making the boundaries between them are less noticeable and smoothing their appearance (Foley et al., 1990).

Since each visible polygon must be accounted for during rendering, objects with higher geometric resolution take longer to render than objects with lower resolution. This means that distant copies of an object that are barely visible and take up very few pixels on-screen will take just as long to render as the same objects seen in close-up, thus wasting rendering time on details that will not be visible. To remedy the situation and reduce the time needed for rendering, computer graphics processes, such as NURBS (Non-Uniform Rational Basis (or Bézier) Splines), allow geometric resolution to change dynamically based on the apparent distance from the viewer, so as to save calculation and rendering time when objects take up less on-screen space (Polevoi, 2000).

In addition to techniques involving dynamic resolution, video game designers have found other ways to limit the number of objects that needed to be rendered in real time, including the obscuring of distant objects in darkness or fog, and the designing of spaces to avoid views that involve great z-axis depth, thus limiting the distance at which objects are visible.

Sonic Resolution

The quality of a game’s sound depends on *sonic* resolution, which is measured in the number of samples per second and bits per sample. Samples are used to digitally reconstruct an analog sound wave as accurately as possible, and each sample is used to indicate the amplitude of a sound wave at a particular point in time. The number of samples per second, then, places an upper boundary on the highest frequency that can be represented, while the number of bits per sample determines the accuracy of representing the waveform's amplitude at any given sample. Since human hearing typically ranges from 20 Hz to 20,000 Hz, compact discs have a sampling frequency of 44,100 samples per second, which places an upper bound of 22,050 Hz for signals that can be reconstructed at that sample rate, thus covering the range of human hearing. Many newer formats, such as DVD-Audio, use even higher sampling rates, some as high as 192,000 Hz.

Although analog signals can suffer from several different types of distortion (namely those of attenuation, phase, amplitude, harmonic, and intermodulation), digital signals can also suffer distortion such as clipping (when not enough amplitude is available during playback due to too few bits per sample), or aliasing due to too few samples per second. Oversampling and anti-alias filtering also help to smooth out signals, but require additional memory and processing. Certain sound formats have been designed specifically for video games, including the VGM (Video Game Music) format, used for SEGA systems in the 1980s, and the PSF (Portable Sound Format), originally used for the first Sony PlayStation, and since then adapted to a number of other systems. Both formats now also include a number of subformats, with different specifications and sampling rates.

Interactive Resolution

Finally, the concept of resolution can also be applied to a video game's interactivity. Like graphical resolution, the resolution of a game's interactivity has two dimensions to it, which can be measured according to the number of *choices per second*, and the number of *options per choice*. Fast-action games will usually have a high rate of choices per second, with reaction an important factor in gameplay. Players often have to react quickly and have little time to decide between options, with choices continually being made. Fast-action games can be made easier by limiting the number of options per choice; for example, in *Space Invaders* (Taito, 1978), players usually have four choices available: move left, move right, shoot, or do nothing. Other kinds of games, such as those of the adventure genre that have more developed storylines and worlds, have slower paces where more time is allotted to players to consider what they should do next, but the number of possible actions they can take is higher and the series of choices they will have are often more integrated, interdependent, and complicated. Usually games will need to have either a high number of choices per second or a high number of options per choice to be considered interesting or challenging; yet if both types of resolution are high the game may be considered too difficult.

Just as other types of low resolution may distract players and call attention to a game's limitations, reducing the frequency of choices and number of options per choice can also frustrate players and make a game's interactive potential seem inadequate. Games with an overreliance on cut-scenes or video clips may be seen as relatively uninteractive, an accusation sometimes leveled at the genre of games known as interactive movies. Too few options per choice may make choices too easy or uninteresting, leading to decreased involvement and engagement in a game, which may also decrease a game's replayability. The greater the frequency of choices that a player must make, the more that player feels a sense of agency during gameplay, while a greater number of options per choice increases the need for decision-making, demanding more consideration from players and giving them more alternatives to explore in later replayings of the same game. These two dimensions of interactive resolution can also compensate for each other; since a greater number of options per choice requires more thought, a player will not need as many choices per second to remain engaged. Likewise, having limited options will not seem as constricting if a player must deal with a large number of choices per second.

Like other types of resolution, interactive resolution depends on the limitations of both the hardware and software used. In the area of hardware, the ability to interact is limited by the sensitivity of input devices, as well as the number of actions and functions they allow (for example, directions of movement and the number of buttons or triggers they contain), as well as things such as processor speeds and loading times. Likewise, the software running a program will determine input speeds, the frequency of screen updates and other types of feedback, and what is possible at any given point within gameplay.

Relationships between Types of Resolution

The various types of resolution found in video games are not isolated in their effects, but compete for resources (such as memory and processing power) resulting in balances and tradeoffs that must be taken into consideration during game design and programming. At the same time, increasing one type of resolution can sometimes be used to compensate for decreases in other types of resolution, as in the example given in the previous section. Thus, one must consider not only the various types of resolution but also the relationships between them.

For example, because they all deal directly with graphics, three types of resolution—spatial resolution, color resolution, and geometric resolution—are closely related. The aliasing in an image with low spatial resolution can be eased with higher color resolution that allows smoother anti-aliasing to be done. Higher color resolution can help reduce temporal aliasing, because it makes motion-blurred imagery possible, since blurs require gradients. Smoother gradients, used by shading techniques, can also reduce the effects of limited geometric resolution. On the other hand, higher spatial resolution can make up for low color resolution by making dithering less noticeable, allowing dithered color gradients to appear smoother. The quality of grayscale imagery is also perceived differently from color imagery, with a wider dynamic range of color making up for lower spatial resolution: so a designer wishing to save memory should reduce the tonal resolution in grayscale imagery while leaving the spatial resolution unchanged; whereas for color imagery, the spatial resolution of color images should be reduced while the color resolution is left unchanged (Ester, 1990). Finally, geometric resolution also depends on spatial resolution, since the number of pixels available for imaging will limit the degree to which complex geometry can be adequately represented on-screen, thus effectively limiting the amount of geometric resolution necessary.

Other relationships exist as well. Temporal and spatial resolution both are factors in determining the limits of interactivity, since they determine the speed of gameplay and what is seen of the game’s world. Greater spatial resolution and greater geometric resolution both require more render time when graphics are produced in real time, slowing down the rendering of frames and decreasing the number of frames per second that a game is able to display. Likewise, more textures and colors mean more use of processing power and a potentially slower frame rate as well. Also, because sound can influence the human perception of color, one could even suggest a relationship between sound and color (Letourneau and Zeidel, 1971). While graphics and sound do not directly limit the resolution of interactivity, they may place limitations on a game's content that in turn limits interactivity. This is true especially of earlier game technology, such as the Atari VCS 2600, where the program running the game had to alternate between accepting input and other tasks such as putting graphics on-screen, producing sounds, and changing color look-up tables.

Although issues involving resolution are less likely to arise as systems grow faster and more powerful and are thus able to provide all the memory and processing power needed for high resolution, new venues such as mobile phones have reintroduced smaller screens to gaming, and state-of-the-art games tend to push their boundaries whatever they may be, allowing issues of resolution to remain important. Also, the concept of resolution often provides a way of comparing and benchmarking technologies, and the measurements of a system's capabilities in regard to the different types of resolution are typically included in lists of specifications.

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Part II

FORMAL ASPECTS

8

ART AND AESTHETICS

Grant Tavinor

Video Games and Art

The video game *The Elder Scrolls V: Skyrim* (Bethesda Game Studios, 2011) can be considered a beautiful representational artifact. The naturalism and rich detail of its environments, the evocative nature of its music, and the exploratory role of the player make playing this game a frequently aesthetically rewarding experience. Video games such as *Skyrim*, and also older games such as *Space Invaders* (Taito, 1978), raise a number of issues within the discipline of aesthetics. Most obvious is the question of whether these games are actually works of art. But in addition to this familiar question are less frequently investigated issues such as the ontology of video game art, the precise role of the player in the artistic performance and appreciation of games, and whether video games have distinctive modes of artistic expression. This essay surveys some of the recent attempts to understand these issues.

Are Video Games an Art Form?

Many gamers and game designers themselves are invested in the issue of whether video games are art, something given evidence by the heat in the many online discussions of this question. What is infrequently noted in such discussions, however, is that there is an existing academic concern with the issue, and a body of theory that significantly clarifies what is at stake in the debate. Numerous academics and theorists have considered the possibility that computer games belong among the arts. Henry Jenkins considers video games as one of the "lively arts," a category introduced by the cultural critic Gilbert Seldes (Jenkins, 2005). Steven Poole thinks that games have the potential to be art "even if they are not there yet" (2000, p. 29). More sustained argument that video games are an art form has come from philosophers of the arts, theorists who are well-placed to resolve this issue (Smuts, 2005; Lopes, 2009; Meskin and Robson, 2010; Tavinor, 2009, 2011; Gaut, 2010).

There are three important points of clarification to be made at the outset of this discussion. First is an ambiguity in the usage of the term *art* in the context of video games. It is customary to refer to as "the art of a game" those formal aspects that embody the design and artistic content, and often in such a way that these aspects are contrasted with game mechanics and gameplay. There have already been a number of published collections of this art (Jenisch, 2009; Kelman, 2006). This customary usage of the term *art* is a complicating factor in the present context because the existence of video game art as a design aspect needs to be reconciled with the potential that video games are themselves *works of art*.

Second, it should be noted that it is not necessary here to show that all games are art: it could be that only a subset of video games are properly considered art. Consider film; it is relatively clear that auteur films such as *Citizen Kane* (Orson Welles, 1941) and *Vertigo* (Alfred Hitchcock, 1958) are art, but that films such as holiday movies need not count as art works. The same may be true for video games. However great *Pac-Man* (Namco, 1980) is as a video game, it is not obvious that it is also art. Indeed, distinguishing between games that are properly called art, and *mere games*, is a part of what a theory of game art should attempt to achieve.

Third, it is necessary to distinguish the claim that there are video games that are works of art from the claim that video games constitute an *art form*. Consider the fact that though Duchamp's *Fountain* (1917) is an artwork, urinals themselves are not an art form in virtue of this fact. Duchamp merely repurposed the urinal to create art. There are numerous instances of artists employing the medium of video games to produce works of art in a similar way. Julian Oliver's *Quilted Thought Experiment* (1998) employs the game engines of the first-person shooters *Half-Life* (Valve, 1998) and *Quake* (id Software, 1996) to allow for experimental live music performances. As in the case of *Fountain*, it could be that even though these uses of game media constitute works of art, the medium of video gaming itself is not an art form in virtue of this. This implies that the important test cases for the status of games as an art form are not so-called "art games" or uses by artists of the medium of gaming for artistic repurposing, but mainstream games such as *Skyrim* and *Space Invaders*.

There is evident resistance to the claim that such video games are art, a fact that is unsurprising if we consider the similar resistance that occurred when cinema was first proposed for art status (Gaut, 2010, pp. 21–50). There are at least two negative arguments against the claim that video games are art, which I will refer to here as the "masterpiece argument" and the "disqualification argument." First, it can be claimed that video games have not yet produced a compelling case of an artistic masterpiece. As film critic Roger Ebert notes, "No one in or out of the field has ever been able to cite a game worthy of comparison with the great poets, filmmakers, novelists and poets" (Ebert, 2010). It is tempting to dismiss Ebert's arguments because he is an outsider with a self-avowed lack of gaming knowledge, but these facts are not relevant to assessing the formal qualities of his arguments. Indeed, the masterpiece argument is credible because many of the games that are held up as cases of artistic games come off very poorly if their artistic qualities are compared with the masterpieces of established art forms. *Red Dead Redemption* (Rockstar San Diego, 2010) is frequently and justly held up as a high point of recent game art, but even in this game the drama and narrative is a rather derivative and often ham-fisted approximation of the Western genre; treated as a film, it is firmly B grade. It is an unexceptionable statement that the narrative, characterization, acting, and writing found in video games are often of poor quality. Moreover, it is difficult to find a single instance where these aspects reach the heights of refinement they do in the confirmed arts.

Presumably the argument here is that if a medium has not produced a work to stand alongside the masterpieces of uncontested artistic forms, then that medium is *incapable* of producing art. But this argument is not conclusive because it is not clear that video gaming needs to have produced a masterpiece to count as art, because there are art forms without masterpieces, for example "minor arts" such as food (Telfer, 1996) and also art forms in early stages of development. Though the presence of an artistic masterpiece in a medium may be a *sufficient* condition for that medium to be art, it is not a *necessary* condition because there may be contingent reasons for why a given art form has not *yet* produced a masterpiece. There is also a further worry here: the comparison of video games with the masterpieces found in other art forms may simply be unfair to video games. Do we even know what a game masterpiece looks like? Perhaps it is unfair to judge *Red Dead Redemption* as we would a film, because it is after all a video game with quite different artistic aims and means. More work needs to be done on the unique nature of video game art to understand its real potential as art; a theory of why some games are art is an important step in achieving this clarification.

The second argument against video games being counted as art is that they may have features not seen in the genuine arts, features that disqualify games from being art: specifically, video games have *rules* and are *competitive*, and they are *interactive*. Again, Ebert (2010) provides an example of this argument when he notes that “One obvious difference between art and games is that you can win a game. It has rules, points, objectives, and an outcome,” and that genuine arts such as theatre, film, and literature, “are things you cannot win; you can only experience them.” Furthermore, “[v]ideo games by their nature require player choices, which is the opposite of the strategy of serious film and literature, which requires authorial control” (Ebert, 2005). Hence, disqualifying video games from the status of art are the facts that video games involve first, competition, and second, audience choice, as neither of these things is seen in genuine art forms such as literature or cinema.

As it stands, these are little more than assertions. Furthermore, it might be pointed out that there *are* interactive artworks besides video games. Dominic McIver Lopes discusses a number of such cases in his theory of computer art (2009). For example, Scott Snibbe’s *Boundary Functions* (1998) is an interactive work that employs a camera and computer to detect the presence of interactors on a stage, projecting Voronoi tessellations that encircle them (Lopes, 2009, p. 25). And yet this response is perhaps not decisive. It is not sufficient to point out previous cases of putatively interactive art, because the opponent of video game art could also simply deny that these interactive works are properly called art. Also, even if these cases of interactive art are beyond dispute it is still difficult to find accepted cases of art that instantiate rules and competitive behavior within the work (Tavinor, 2009, p. 192).

While it is true that interaction and competition are not characteristic of most traditional art—and these qualities are more commonly associated with the categories of *games* and *sport*—it is one thing to claim that the previous art has not typically included some feature, and another thing to demonstrate that future art cannot have that feature. A further argument is needed to justify the claim that these qualities disqualify an artifact from being art.

Moving beyond these negative arguments, what positive reason is there to think that video games are or can be art? There is at least one argument that is not decisive in favor of video games being considered art. As noted at the beginning of this essay, video games clearly have art design, and there are artists involved in their construction. It might be thought that these are prima facie reasons to think that video games are artworks. However, I have argued elsewhere that not everything with evidence of art design is properly called art, with television shows, greeting cards, and magazine advertisements being examples (Tavinor, 2009, p. 173). It could be that the art design evident in games plays the superficial function of providing an aesthetically pleasing presentation of the game, without that game subsequently being a work of art.

The claim that video games are art can be backed up by invoking a definition of art (Smuts, 2005). To assess the art status of video games the natural approach would be to attempt to identify in video games the qualities that are held to be the defining qualities of art. Two difficulties here are that definitions of art are themselves contentious with a number of current candidates (Davies, 1991), and also that the art status of games might differ depending on the definition we choose to employ.

These problems can be somewhat avoided by employing a “cluster theory” (Gaut, 2000) or “disjunctive definition” of art (Dutton, 2009). Though they are importantly different, these approaches to characterizing art are similar in that they claim that there is no one essential property to art, rather art is characterized by a *cluster concept* or *disjunctive list* of qualities. Typically included as characteristic of art are aesthetic properties, the display of a high degree of skill or creativity, the application of criticism, emotional expressivity, formal complexity, imaginative experience, individual point of view or style, and the presentation of intellectually challenging or meaningful ideas. An object is a work of art if it has sufficient of these attributes; and importantly, artworks can lack individual such properties if they instantiate enough of the core to be recognizable as art.

There are many video games in which most of these features can be found. This seems most obvious in the so-called “art games” such as Jason Rohrer’s *Passage* (2007) and the works of Julian Oliver. But also, the trend in mainstream video games has been toward games that encompass more and more of this characteristic artistic territory. So returning to *Skyrim* we see obvious aesthetic properties; a representational artifact that gives evidence of being constructed with great skill, creativity and style; a work that is subject to criticism and that is emotionally expressive; and an artifact that has a high degree of formal complexity (think especially of the narrative or spatial complexity of the game). *Skyrim* is not especially intellectually challenging, but as noted, under a disjunctive definition the lack of one of the criteria is not decisive; furthermore, the lack of intellectual challenge is characteristic of the “mass arts,” a form of art theorized by the philosopher Noël Carroll, of which video games seem an obvious candidate (Carroll, 1998). Hence, because *Skyrim* is an artifact that exemplifies so many of the characteristics of art it may be unfair to deny the game the appellation.

And yet, under this approach, not all video games will count as works of art (Tavinor, 2009, p. 191). *Space Invaders*, even though it is one of the greatest of all video games, may not count as a work of art because it has a very partial overlap with the qualities found in the disjunctive definition of art. However, that there are video games that are not works of art does not mean that video gaming is not an art form, because similarly, there are paintings and films that are not art even though cinema and painting constitute art forms.

What Kind of Art Form Are Video Games?

If video games are a form of art, what *kind* of art is the art of video gaming? It is worth pausing here to consider the meaning and rationale of this question. One might think that explaining video games as a kind would attempt to pick out their necessary and sufficient conditions through an essentialist definition, showing how they are unique as art. I have doubts that anything like this can be done for artistic video games; rather, a theory of games as art should be pragmatic and should give us some guidance in explaining and appreciating the art form. The question of what kind of art video games are is best answered by situating games within the theoretical context that illuminates their distinctive modes of artistic creation, experience, and expression.

Games theorist Mark J. P. Wolf suggests that “video games can be considered as graphic art, as time-based art, as narrative art, as interactive art” (2010). It is true that games have each of these features, and that there is much to be learned by examining these aspects. And yet this collection of features is very much a list of structural and artistic traits that video games happen to display as artworks, and it is a list that might well be augmented with other artistic facets such as spatiality, representation, music, animation, and so on. I suspect that it is Wolf’s last named aspect—interactivity—that is crucial to understanding video game art, and indeed that it is the interactivity of video games that explains the distinctive modes of graphical, time-based, and narrative art found in video games.

Several philosophers of the arts have already argued that it is the inclusion of interactivity that sets video games apart from other graphical, narrative, or cinematic art forms (Lopes, 2009; Gaut, 2010; Tavinor, 2009, 2011). Lopes argues that video games are at the popular end of the spectrum of “computer art,” a form of art he thinks is partially characterized by its interactivity (2009). Berys Gaut considers video games as a form of “digital interactive cinema” (2010). I have made a similar claim in arguing that mainstream video games are a form of “interactive mass art,” drawing together the theoretical understanding of philosophers such as Lopes and Carroll with a careful analysis of video game technology and practice (Tavinor, 2011).

Within games studies and technology writing there has been some skepticism about the usefulness or coherence of the concept of interactivity (Manovich, 2001; Aarseth, 1997). In an earlier paper on the topic, Lopes, though noting that the term frequently is just a “buzz-word,” defines interactivity in an artistic context as being where the user makes decisions that impact on the artistic structure of the work as it is displayed (2001). Refining this definition, Gaut points out that because some performance arts authorize the performer to change the work in the process of interpreting the work, without the work thereby becoming interactive, that interactive works are those where the “audience” specifically has a shaping role (Gaut, 2010, p. 143). Hence an interactive art work is one in which the audience makes decisions that affect the artistic structure of the work’s display.

Video games are a clear case of such interactivity. Interactivity is certainly not *unique* to video games because it is shared by works of interactive computer and video art (Lopes, 2009). But because of the impact of player choice on the *ontology* of video games as an art form, interactivity is a central concept in understanding the distinctive modes of artistic creation, expression, performance, and interpretation that attend their art. The remainder of this essay explores how the role of interactivity in the ontology of video games affects the resulting art.

An ontological theory concerns the mode of existence of an object or kind of object, and with art, ontological theories are crucial to explaining how differing works of art are produced and appreciated, and the nature of their expressive properties (Thomasson, 2004). A number of observations can be made about the ontology of video games as art. Many artworks are comprised of a singular object, such as where Michelangelo’s *David* is identical with a particular lump of marble that can be found in Florence. A multiple instance artwork, however, may be instantiated in a number of spatially and temporally distinct artifacts, such as the film *Star Wars* (George Lucas, 1977), which can be screened any number of times at different sites. Though the existence of singular video games is not a conceptual impossibility, it is clear that the vast majority of video games have a multiple instance ontology because they exist in multiple spatial and temporal instances.

Multiple instance works are typically *reproduced* for appreciation, though the exact means through which a work is reproduced varies between media. Multiple instance works are usefully characterized by the logical "type/token" distinction, so that the film *Star Wars* is a work *type* that can be instantiated by a number of work *tokens*, which are comprised of individual screenings of the work. Where a film is reproduced by a screening, a video game is reproduced through its various *playings*, which are dual acts of performance and interpretation (Gaut, 2010, pp. 145–146). Thus, the ontology of a video game such as *Skyrim* is of a work type with number of tokens in the form of different playings. It is because video game works are instantiated through this audience participation that they are fruitfully considered as interactive works.

Because multiple instance ontology is a further definitional feature of Carroll's characterization of "mass art," and because they typically gravitate toward accessible art, mainstream video games such as *Skyrim* are likely to count amongst the mass arts (Carroll, 1998, p. 196; Tavinor, 2011). But despite this ontological similarity, the interactivity of video games means that they differ to the other mass arts in the degree of variation among their tokens. In a film such as *Star Wars* one can expect the action to unfold in a set order and pace: Luke will discover the charred corpses of Uncle Owen and Aunt Beru, leave the planet of Tatooine, and eventually destroy the Death Star in his X-Wing fighter. But in different playings of *Skyrim* one cannot have clear expectations about the content and its order of presentation. So, for example, in the main quest of the game the player learns that the leader of the mysterious Greybeards is in fact a dragon named Paarthurnax. Because in his past life the dragon was responsible for the killing of the defenders of the line of kings, the Blades, the player is given the choice by the Blades to either kill Paarthurnax or forgo their aid. This plot event, and its outcome, is a variable occurrence within the game. Hence, the various tokens of *Skyrim* differ in terms of their representational content, and these differences are attributable to the decisions the player makes and to the representational variables determined by the game algorithm.

A video game token is an individual playing, but what kind of thing is a video game type? With film, the work type is composed of an abstract audio-visual structure that via *templates* such as film reels and digital files can be reproduced on a number of different occasions (Carroll, 1998, p. 218). But video games do not have such reproducible templates because of the variation in their instances (even if their programs are usually distributed via templates such as CDs and downloadable files). The work type of *Skyrim* is not a template from which a screening of this work is reproduced, but a computational structure that is capable of producing any number of displays of the work when it is interacted with. Specifically, the work type with video games is composed of *a game algorithm as interpreted through a collection of artistic assets*, and it is this object that produces the game token or display via the interaction of the player (Tavinor, 2011; see also Tavinor, Chapter 53, this volume).

This definition of the work type in video games acknowledges the customary distinction between game mechanics and art design referred to at the beginning of this essay, but holds that both aspects are necessary for video game ontology. Furthermore, here we have the means of relating the art design evident in video games with their status as artworks: the style, creativity, representational content, imaginative experience, and aesthetic qualities largely attributable to the artistic assets of video games, and that the extent of these features matches that seen in uncontested art forms, are the reasons why such games now fit within the cluster theory and/or the disjunctive definition of art.

The interactive ontology of video game art has an impact on the artistic interpretation of games. Returning to the dilemma involving the dragon Paarthurnax, we can recall that in this episode the game provokes the player with the choice of letting the dragon live and forgoing the aid of the Blades, or of killing the venerable dragon to further the player-character's own goals. Paarthurnax, as the player discovers, loves to talk, and one of the frequent topics of his conversations is the mastery of one's power. In an ethical turn, he asks the player: "What is better: to be born good, or to overcome your evil nature through great effort?" Paarthurnax has taken on peaceful ways through a battle with his own dragon nature, and through his model of action something is suggested about the player-character's proper response, and the mastery of his or her own increasing power in the game world. The eventual meaning of this episode depends on the player's actions when faced with this dilemma; reflecting on the dragon's words might lead one to a different course of action than where one plays the game insensitively. In the former case it becomes a sensible prospect to interpret the eventual actions of the player-character in a richer and more satisfying way.

Other mainstream video games such as Mass *Effect* (Bioware, 2007), *Grand Theft Auto IV* (Rockstar North, 2008) and *Red Dead Redemption* have employed this player-oriented interpretation to good effect, and it is a large part of their virtue as art that they are able to connect to the player in this way. But one could not understand the meaning and virtues of such works without placing them within something like the art-theoretical framework that I have developed here to see that in interactive artworks the player's performative role partly constitutes the work's instances. This is just one way in which the investigation of video games as a form of interactive art is likely to be of great interest.

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9

COLOR

Simon Niedenthal

Color has formed the visual substrate of video gaming since the 1970s. As with film, the significance of color in the medium can be traced through the history of technology and design practices, and has consequences for game aesthetics, player emotion, and embodiment. Early monochromatic home systems such as the Magnavox Odyssey (1972) featured plastic overlays that added color to games (Winter, 2010), extending the visual experience of gaming in a manner analogous to the hand tinting of early cinema pioneers such as Méliès (Yumibe, 2012). Nintendo introduced its “Color TV” home gaming systems in Japan in 1977 (Plunkett, 2011b), and arcade technologies enabled color output to raster-based and vector-based displays several years before games such as *Pac-Man* (Namco, 1980) and *Tempest* (Atari, 1980) were released. In the first few years of the history of the medium, video game designers quickly gained a limited, discontinuous palette of colors that expanded and became more nuanced over time. The 8-bit sprite-based games of the late 1970s and early 1980s articulate a basic vocabulary of color for interactive play that laid the foundation for later 16-bit and 3-D games, in which color serves both functional and evocative aims.

Analysis of the uses of color in the history of video games begins with traditional color theory. The color contrasts of Johannes Itten (1970), developed at the Bauhaus in the 1920s, provide useful categories, though Itten’s color theory emerges from the static fields of painting. The expression of color in games, however, is rooted in the designer’s creative struggle with a specific gaming platform, and is realized ultimately in the dynamic experience of play. Unlike the common practice in traditional color theory, in which object and light color are considered separately (Hardin, 1988), any discussion of color in video games needs to acknowledge the unique synthesis of light and color that is implicit in computer graphics, as well as the linkage between game color and gameplay emotion. Monochromatic or achromatic games, such as *Limbo* (Playdead, 2011), instill melancholy qualities of mood, space, and depth by sapping color from the world. At the other extreme, games such as *Rez* (United Game Artists, 2001) demonstrate the potential of video games to fuse color effects with gameplay emotion as a means of achieving a state of “voluptuous panic” (Callois, 2006, p. 138).

We receive color from games as we receive all color: light enters the eye as a spectrum of hues, differentiated by wavelength, and is absorbed by the retina. In addition to directly experiencing color, we also communicate its qualities. Many of the color organizing systems that we use to select, manipulate, and understand color reflect the way in which we describe color to one another. The Munsell system, for example, breaks color into the components of hue (base color and position on the color wheel), value (relative brightness or darkness), and chroma (or saturation, the amount of neutral gray value mixed into the color). The way in which color is specified in video games and computer graphics, however, is not perceptually organized in this manner: colors exist as numerical red, green, and blue (RGB) values that lend themselves to computation, and are ultimately displayed within the additive color space of screen light, in which the RGB primaries mix to form white. The nuances of color in computer graphics are dependent upon the internal memory allocated to determine the color of each pixel. "Color depth" describes the number of individual colors that a file format can express: 8-bit color is capable of defining 256 discrete colors, 16-bit renders 65,535 colors, and 24-bit over 16 million (Stone, 2001).

The designers of the first video games made the most of color limitations, and the best of the early 8-bit games possess a jewel-like beauty. The environments of *Sabre Wulf* (Ashby Computers and Graphics, Ltd, 1984), a game for the Sinclair ZX Spectrum, glow like stained glass, and the effects of color purity are enhanced by contrast with the black background. Sprite-based games, in which individual game elements are animated against a background, often display significant contrast between figure and ground, a feature of the process by which the image is drawn on the screen. Indeed, is fair to claim that there is a lot of black in early games, and not just those set in outer space.

Working individually or in small groups, game programmers in the 1980s quickly developed a basic vocabulary of color for interaction, wrestling with the refractory materials of early game systems. Consider the *Tetris* (Pazhitnov, 1984) tetramino: depending upon the platform, the J-shaped puzzle piece was successively colored white, magenta, blue-violet, yellow, or orange, before finally being standardized as blue. The J tetramino has no meaningful real-world referent, and the choice of color for the puzzle piece is arbitrary—the only important thing is to differentiate it from other tetraminos so that it can be rapidly rotated into position as it falls. This is one of the most basic forms of color design for games: using color to identify and differentiate elements within the game scene and interface, and to direct the eye appropriately.

A similarly fundamental use of color works in a temporal manner, establishing memorable game environments and creating variation in the experience of navigating virtual space over time. *Knight Lore* (Ashby Computers and Graphics, Ltd, 1984) was also designed for the Sinclair ZX Spectrum, a fairly crude machine that tended to have difficulties with color bleeding of superimposed hues (Collins, 1998). In *Knight Lore*, notable for its rendering of orthographic 3-D space, each of the more than 100 rooms of the game are defined with a single color—yellow, green, blue, or magenta—including the player's avatar, which changes color to match the room. Every scene change invokes a color change, providing a very basic source of visual variation and relief.

Other essential functions of color developed in early games to support player activity, either by indicating affordances for future actions, or else providing feedback for completed player moves. Hue in some versions of *Pac-Man*, for example, is used to indicate edible affordances for the protagonist; perhaps the fullest later development of this strategy is in *Mirror's Edge* (EA Digital Illusions CE AB, 2008), in which red in the otherwise neutral environment cues the player to platforming and way-finding affordances. Finally, color can be used to acknowledge that the player has taken an action and that the game state has changed. In *Miner 2049er* (Big Five Software, 1983), for example, zones of color are filled in beneath the avatar as the player progresses through each screen. Color feedback can also take the form of reward: completing a level or setting a high score in the vector-based arcade game *Tempest* is accompanied by a burst of colorful fireworks.

Increases in computing power and new gaming platforms extended and enriched the color palettes of video games through the 1990s. These developments granted game designers a number of intermediate hues, values, and degrees of saturation, allowing for more nuanced color choices and the option to create game worlds with greater verisimilitude. One of the most basic color design decisions is choosing the colors of the limited palette that will be used, and we can consider Itten's basic color contrasts as dimensions for categorizing the color palettes of entire games or sections of games. The human visual system responds most vigorously to changes in the visual field, rather than to stasis and homogeneity (Hardin, 1988), and, accordingly, Itten proposed seven color contrasts: hue, light–dark, cold–warm, complementary, simultaneous, saturation, and extension (Itten, 1970). We can, for instance, make general statements about games that contain relatively saturated (*Jetset Radio Future* by Smilebit, 2002) vs. desaturated (*Shadow of the Colossus* by Sony Computer Entertainment, 2005) color palettes. Predominantly warm (*Journey* by thatgamecompany, 2012) vs. cool (*Gears of* W *ar* by Epic Games Inc., 2006), light (*Echochrome* by Will, 2008) vs. dark (*Fatal Frame II: Crimson Butterfly* by Tecmo Ltd, 2003); these are further dimensions that we can employ to distinguish the use of color in games. Achromatic games composed of light–dark tonal variation, such as *Limbo*, rely upon grayscale changes to communicate space, depth, and player focus, and draw upon the emotional power of a muted world.

Itten's categories allow us to begin to identify the aesthetic color choices made by game designers. There are several different tools that are useful in the analysis of color palettes in games. Swatches generated by sampling the colors of game scenes provide one method of drawing broad comparisons between games, helping to identify patterns and initiating discussions about the uses of color. One article on game color reduces the color design of specific games to a single Pantone chip (Plunkett, 2011a), a strategy that forces reflection on the significance and memorability of individual colors within games. A more precise method of comparing color is to generate histograms within game worlds. Canossa explores color palette choices in a level of *Hitman: Blood Money* (IO Interactive, 2006) by generating a 360-degree panorama every 5 seconds, then analyzing the images in the histogram tool in Photoshop (Canossa, 2009). This process allows more detailed conclusions to be drawn about luminosity and relative color changes as one moves through the level. Finally, powerful image processing and analysis tools hold promise for extracting color information from complete game walkthroughs or speedruns (Huber, 2010).

The popularity of 3-D games in the late 1990s signaled the shift to a new paradigm for color, one in which pixel color output is calculated by the game engine renderer based upon contributions from illumination sources in the scene as well as surface color. In these games, simulated illumination and color need to be considered together, as the distribution and qualities of light and shadow affect one's perception of the color palette of the overall game scene. Further, color choices in 3D games can be discussed with reference to cinematographic functions, such as creating depth, conveying time of day and season, enhancing mood, atmosphere, and drama, and revealing character personality (Calahan, 2000; Seifi et al., 2012). Often working in teams organized by specialization in a manner not unlike the film industry, game designers have continued to exploit the functional uses of color in games, with a new freedom to explore the evocative potentials of color in storytelling and the dynamic modulation of emotion (Seif El-Nasr et al., 2007). After 30 years of development, the black vacuum of *Space Invaders* (Taito Corporation, 1980) has given way to the beautifully variegated and shifting hues of the sky over Istanbul in *Assassins Creed: Revelations* (Ubisoft, 2011).

Color in games is indeed striking, though it remains woefully underexplored as a topic in game studies research. There are over 3,000 items in the Digiplay Repository of game studies articles (Rutter, 2012), but only 1 with "color" (or "colour") as a keyword. Color also receives scant mention in most of the widely used game design texts. Instead, one has to hunt out game color discussions in writings on level design, computer graphics, platform studies (Montfort & Bogost, 2009), or game industry post-mortems (Fiorito & Stitt, 2000). One reason for this apparent neglect has to do with the status of aesthetic raw materials in complex artistic constructions. Ever since Aristotle, aesthetic hierarchies have relegated the sensory display that the audience immediately experiences—termed the enactment or "spectacle" in the *Poetics*—to the bottom of the creative hierarchy, the furthest removed from the formal means by which the poet evokes the full emotional power of his or her medium (Aristotle, 1996). In his updating of the *Poetics* for interactive media, Mateas remarks that "the mechanics of interaction (spectacle) provide the low-level resources for player action" (cited in Waldrip-Fruin & Harrigan, 2004, p. 25). We have seen that color indeed serves this function in games. Yet it is a commonplace among artists and designers that color and light also have an immediate and powerful effect upon the emotions. How can we understand the contribution of color to the full gaming experience?

Teasing out the contribution of color to the play experience vis-à-vis the other elements of games—story, character, sound, interaction modes, and player activity—is challenging, for several reasons. First, speculating about player response to color is complicated by the vagaries of transmission and display; it is difficult to make any assumptions about the monitor settings, cabling, and ambient illumination in play spaces. Further, color effects can be subtle, video games are a highly complex and evocative medium, and there are few integrating frameworks that really do justice to the experience of color. And finally, games are capacious and engaging learning systems, in which new color associations can be established within the span of individual games.

Despite these challenges, there are several key strategies for understanding the player's response to color. The first approach—acknowledging the influence of culture upon color reception—seeks to identify the symbolism of individual colors. Red, for example, is frequently used as a wash over the game image to indicate flagging player health, drawing upon associations with blood and danger. But most hues are associated with a range of meanings; according to Zammitto (2005, p. 4), black can express "death, evil, criminality, hidden aspects, sinister, depression, grief, pain, repression, hopelessness but also sophistication, authority, style." Running representative games through this list demonstrates some of the limitations of a symbolic approach: in many early sprite-based games, for example, it makes more sense to consider black as a contrasting ground for activity and feature of the technology of rendering than as a bearer of symbolic cargo. The fact that the player can learn new color associations within a single game also makes it difficult to claim that a specific color will hold a given meaning for the player. Context is very important to the meaning of color in games.

A second strategy for understanding the shared meanings of color in games is to mine the tacit knowledge of game designers. In one study we conducted, a game level depicting a large walk-through model of a human heart in a museum interior was created in the Hammer game engine, with in-level controls for setting illumination brightness and hue. During a workshop, game designers were asked to light scenes and create concept art for three game genres set within the level: an educational game for children about understanding the body and the circulation of blood, a relationship game for adults, and a stealth or horror game. The results suggested that each genre was associated with a specific palette: the educational game evoked a mixed and saturated palette, the relationship game tended to look warmer, and the horror and stealth scenarios were played out in dark and cool environments (Niedenthal, 2008). These patterns suggest that color palettes in games achieve some of their power through resemblance: generic associations within and across media work to prime player expectations and responses.

A third approach to game color is to borrow methods from experimental psychology to explore player response to color in custom game segments. Studies of the effects of color suggest that color has an impact upon emotion (Gao & Xin, 2006), and one can identify a parallel body of research in the area of light (Knez, 2001). There is, however, a great deal of disagreement in the results from studies of color and emotion. According to Valdez and Mehrabian (1994), this is due to problems with color stimuli in experiment design, and to differences between interpretive frameworks. They found that the emotional response to color could be attributed almost exclusively to the effects of value and saturation, rather than to hue. Seeking to extend color studies to a virtual environment more appropriate for understanding games, Joosten et al. (2010) found that red is experienced as arousing, and yellow as positive, though their observations proved valid only for inexperienced players, and the experiment's stimuli colors were limited by the toolset used to construct the game level in the Neverwinter Nights engine (BioWare, 2002). In another study, players navigated through a maze-like Hammer environment lit with warm and cool hues that were controlled for value and saturation with histograms. The results suggested that warm illumination is associated with greater positive affect and better play performance, but it is difficult to draw any broader conclusions from this study due to the elementary nature of the game task (Knez & Niedenthal, 2008). Emotion researchers conducting empirical studies of color in game worlds still face a number of significant experiment design challenges.

Instead of creating custom game environments in which to study player emotion, we can gain a better grasp of the unique characteristics of video game color by examining the ways in which existing games engage color in play activities, and link color effects to gameplay emotion. There are several games in which a key gameplay goal is to bring color to the world; in *Okami* (Clover Studio, 2006)—which has a strong nurturing component—revitalizing a desolate game world triggers animated sequences of blossoming flowers that function as a reward for the player. These scenes dynamically link the emotions that the player experiences in the game (concern, satisfaction) with a color correlative. *Flower* (thatgamecompany, 2009) fuses the experience of speed and swoopy navigation with saturated sky and landscapes to bring about a similarly heightened awareness of the natural world.

Besides environmental color, many games also employ color effects to a similar purpose. Video games are distinguished by powerful and transitory color effects used in a performative manner to stand for a range of functions, including spell casting in role-playing games and motion-blurred attacks in fighting games. Explosions and fireworks also feature in many game genres (Niedenthal, 2010), including rhythm games such as *Boom Boom Rocket* (Bizarre Creations, 2007) and puzzle games such as *Fantavision* (Sony Computer Entertainment, 2000).

In games with fireworks simulations, bursts of color are often timed to the player's controller input, establishing a rapport between the display of shell detonation and the player's experience of tension and release. Game color receives its fullest expression through these ephemeral forms. *Rez*, for example, was influenced by Kandinsky's paintings, but the game achieves much of its power by linking hallucinatory bursts of hue to the gameplay emotion of a first-person rail-shooter. The lesson of *Rez* is that color can constitute a fundamental form of play in a video game.

This is also the sort of play that happens during the Indian holiday of Holi, when free-form color hijinks accompany a time of misrule and overturning of hierarchies. You "play" Holi by ambushing friends and pelting strangers with saturated pigments, or hosing them with colored water. Holi color play is an example of what Callois terms "a vertigo of the moral order, a transport that suddenly seizes the individual. This vertigo is readily linked to the desire for disorder and destruction, a drive which is normally repressed" (2006, p. 139). Like Holi, the bursts of simulated firework shells in *Tempest* or *Fantavision*, the colorful explosions of *Rez*—even the splatters of hue in a round of paintball—establish a tie between color and Callois' concept of *ilinx*, the sensory whirlpool. This is the color space that video games can simulate very well: a synthesis of sensuous wonder and strong emotion that constitutes the purest expression of color in games, and is key to the contribution that video games can make to the broader field of color in art.

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10
CONVENTIONS
Bernard Perron

It is an obvious statement to declare that games are rule-based. From the famous definitions of Johan Huizinga and Roger Caillois to the recent ontological accounts of video game scholars, one is expected to follow strict principles of conduct in order to play a game. These principles are permitting as well as prohibiting means and actions to achieve specific goals and to obtain a particular and/or a final result. Insofar as the act of regulating is enforced by a computer program, video games are even more bound by their set of rules. However, these fundamental and explicit regulations hide other ones, less clear but as cardinal to the game activity: conventions.

Rules and Conventions

Rules and conventions go hand in hand. The terms are often used interchangeably, to start with Roger Caillois for instance. In the introduction of the French edition of *Man, Play, and Games* (not translated in the English version), Caillois defines games as follows:

> Any game is a system of rules. These define what is or not a game, that is, what is allowed and what is forbidden. These conventions are at the same time arbitrary, imperative, and without appeal. They cannot be violated on any account, or else the game ends right away and is destroyed by the same fact.
>
> ([1958] 1961, pp. 11–12, my translation)

The fifth essential quality of play is, for him, "[g]overned by rules: under conventions that suspend ordinary laws, and for the moment establish new legislation, which alone counts" ([1958] 1961, p. 10). When Caillois places his four categories of games on a continuum between two poles, the uncontrolled fantasy he calls *paidia* is opposed to the *ludus,* which is "a growing tendency to bind it [this *paidia*] with arbitrary, imperative, and purposely tedious conventions" ([1958] 1961, p. 13). Yet, the section of his chapter where he deals in more detail about the combination of two poles is entitled "From Turbulence to Rules" ([1958] 1961, p. 27). *Mimicry* (or simulation), the third category he distinguishes,

> exhibits all the characteristics of play: liberty, convention, suspension of reality, and delimitation of space and time. However, the continuous submission to imperative and precise rules cannot be observed—rules for the dissimulation of reality and the

> substitution of a second reality. Mimicry is incessant invention. The rule of the game is unique: it consists in the actor's fascinating the spectator, while avoiding an error that might lead the spectator to break the spell.
>
> ([1958] 1961, pp. 22–23)

Then, in order to show that *ludus* is compatible with *mimicry*, Caillois states:

> However, it is the theater which provides the basic connection between the two, by disciplining mimicry until it becomes an art rich in a thousand diverse conventions [this is the word employed in the original French version, translated in English as "routines"], refined techniques and subtly complex resources. By means of this fortunate development, the cultural fecundity of play is amply demonstrated.
>
> ([1958] 1961, pp. 30–31)

The notion of conventions might be more clearly thought in terms of rules insofar as games are seen as part of culture. Conventions are then not seen as constitutive or operational rules. They are unwritten and/or implicit rules. This is how Katie Salen and Eric Zimmerman define them when they address games as cultural environments. And the authors of *Rules of Play* (2003, p. 574) state that conventions are essential to games:

> But taking on the lusory attitude doesn't just mean accepting the limitations of the operational rules. It also entails following implicit rules. Playing a game means submitting to the authority of the magic circle, which includes the cultural conventions expressed through implicit rules.

It is the "unstatable customs" that make players engage with the appropriate seriousness and perform acts of fair play. Those behaviorial guidelines are socially constructed. It is on account of such constraints guaranteeing and regulating our way of thinking that Peter J. Rabinowitz has studied narrative conventions and theorized the understanding, analysis, and interpretation of fiction reading in relation to rules. According to Rabinowitz: "The term *convention* may appear, at first, somewhat restricted—for many people, when they think of literary conventions, think of formulas of plot and character. Conventions, however, inform our reading in far more complex ways" (1987, p. 42). They are not "waiting to be uncovered in a text, but in fact *precede* the text and make discovery possible in the first place" (1987, p. 27). To comprehend the operations required to create meaning out of a text, Rabinowitz offers a system comprised of four types of rules: the rule of notice, the rule of signification, the rule of configuration, and the rule of coherence.

Although rules and conventions can be interchanged (and other synonyms employed for the sake of style) while discussing the conditions that govern procedures and behaviors, the concepts still need to be distinguished to remain significant. This is the point made by Robert Rawdon Wilson who examines the game/text analogy in *In Palamedes' Shadow. Explorations in Play, Game & Narrative Theory*:

> The argument will be here that conventions are looser, less abstract, more resistant to formulation, and altogether more flexible than rules. They are learned differently from

> the way rules are normally learned: not deductively, as tightly construed prescriptions to be applied, but inductively, as a matter of experience and through practice.
>
> (1990, p. 85)

Rules are explicit and rigid. Unless someone wants to cheat, they need to be followed. On the contrary, conventions "cannot be broken; they can only be ignored or neglected" (1990, p. 87). There is no sanction when a convention is disregarded or misread; the activity is not even destructive. That being said, a knowledge of conventions has an impact on the ongoing action.

The Rules of Conventions

In its juridical sense, a convention is an agreement between parties for the regulation of matters affecting them. It belongs to the domain of voluntary exchanges. This meaning is shedding light on how conventions are generally grasped. In Peter J. Rabinowitz's aforementioned theory of narrative, reading fiction is a conventional activity as it presupposes an assumed contract between author and reader where reality is to be understood according to certain paradigms. As David Bordwell and Kristin Thompson state in *Film Art: An Introduction*, such a conception applies to much more than literature:

> Very often conventions demarcate art from life, saying implicitly, "In artworks of this sort the laws of everyday reality don't operate. By the rules of *this* game, something 'unreal' *can* happen." All stylized art, from opera, ballet, and pantomime to slapstick comedy, depends on the audience's willingness to suspend the laws of ordinary experience and to accept particular conventions. It is simply beside the point to insist that such conventions are unreal or to ask why Tristan sings to Isolde or why Buster Keaton doesn't smile. Very often the most relevant prior experience for perceiving form is not everyday experience but previous encounters with works having similar conventions.
>
> ([1979] 2004, p. 53)

In the video game, it is, for instance, illogical to find ammunition (and medkits with the well-known red cross painted on them) scattered all around in the space of first- and third-person shooters. According to common sense, the enemies wouldn't leave such valuable and lethal items that might be exploited against them lying everywhere. To make the gathering more dynamic, ammunition and other items have been hidden in wooden crates that need to be smashed as the theoretical physicist Gordon Freeman is so often doing with his crowbar in *Half-Life 1* and *2* (Valve, 1998 and 2004). For a better integration into the idea of combat, ammo can be picked up from killed enemies; nonetheless, there is no need to crouch to pick them up. All you have to do is to pass over dead bodies and dropped ammo as in *Wolfenstein 3D* (id Software, 1992) where a quick flash and synthesized sound signal that clips have been added to the inventory—in later first-person shooters, pickups such as these will be indicated by various weapon cocking sounds. Ammunition may also be gathered from dropped weapons, but only once the gamer carries the same armament in his arsenal, as in the *Call of Duty* series (Activision, 2003–present).

Conventions lead to the same effect as rules and fiction. Following Jesper Juul's discussion in

Half-Real: Videogames between Real Rules and Fictional Worlds: “Rules separate the game from the rest of the world by carving out an area where the rules apply; fiction projects a world different from the real world” (2005, p. 164). Conventions furthermore help, referring to Huizinga’s terms, to get into the “magic circle” and see “temporary worlds within the ordinary world” ([1938] 1955, p. 10). Nevertheless, they differ from rules. To turn to Juul again, he observes that a player

> cannot possibly predict the gameplay of a game simply by reading the rules. In video games, the rules are initially hidden from the player—this means the player is more likely to use the game world to make inferences about the rules. In fact, the player may need a fictional game world to understand the rules.
>
> (2005, p. 176)

Undeniably, it is more unlikely that a player will read about the conventions of a game. Referring to the previously mentioned example of the wooden crates to be smashed in first-person shooters, Juul explains that “[f]or an inexperienced player, this is nonsensical and not cued by the representation: Only the trained player knowing the conventions of the game genre would understand it” (2005, p. 179). While it is by trying and failing to pick up ammo from a gun s/he doesn’t own yet that a gamer learns the rule of ammunition gathering, nothing definitely tells her at first to destroy some crates to refill her weapons, unless an icon appears every time the player-character is near such a crate, as in *Resident Evil 6* (Capcom, 2012); crates are frequently utilized for other purposes in video games, such as cover protection, climbing support, labyrinth construction, etc. This conventional action becomes meaningful in that it has been seen and performed in previous games. If conventions can be seen as implicit rules in video games, it is because they are hidden in more than one game. Game rules, mechanics, and controls become conventional when they are used in many video games.

Gameplay Conventions

In accordance with Caillois’ previous comment about theater, each art comes to elaborate its conventions according to its own features: real actors on stage for the theater, audiovisual recordings shown on a screen for cinema, or digital data that can be acted upon via an interface for the video game. For example, while an entrance and an exit of characters divide the various scenes in the classical theater, it is a fade-in and a fade-out (or a dissolve) that are used as transitional devices in a classical film, and the clearance of aliens’ rows that separates the levels in arcade games in the vein of *Space Invaders* (Taito, 1978). Likewise, video games have remediated conventions from theater and film. The interior locations of early 2-D graphical adventure games such as *Maniac Mansion* (Lucasfilm Games, 1987) were designed like theater stages, with the absent fourth wall giving access to the action and the entrances and exits of the player-character stage left or right leading to another room. When 3-D computer graphics could be overlaid on pre-rendered static backgrounds, as in *Alone in the Dark* (Infogrames, 1992), the game space was fragmented into various fixed camera angles. And since the window into the world of video games is mainly considered to be a virtual camera, there are still many codes borrowed from the movies. Yet, it is the gameplay, or the actions of the gamer within the virtual playground (being a whole inhabited world or an abstract space) and the reactions of this playground, that distinguishes the video game from theater or film.

To reiterate both the question and the answer of Juul (2005, p. 123) about *Donkey Kong* (Nintendo, 1981): Why does Mario have three lives? Because the game would be too hard to play with only one. This sort of reply can be invoked for many different facets of video games: the regenerating health; the sparkling effect of important items; the quantity of weapons, ammunition or things the player-character can carry along; the extra-diegetic music being heard upon a dangerous situation; the barking of soldiers looking around for the infiltrated player-character; the stealth meter indicating the player-character is hidden in a dark area at the feet of an opponent although the image is quite well-lit; the different shady edges or stones that can be used to climb up a wall or a rock; the overhead radar and compass of a HUD (heads-up display) displaying the position of allies or enemies and indicating the right direction to the next goal; the checkpoints and quick saves, etc. Since the video game is also an art rich in a thousand diverse conventions, these can hardly be all taken into consideration at once. We nonetheless can broadly distinguish two types of gameplay conventions.

The first type of gameplay convention—briefly discussed above—consists of the ones giving the gamer support or information so that s/he can play the game more easily. In keeping with the projection of a game world different from the real world, one key helpful convention of video games that needs to be underlined might be best described by Dorothy Heathcote's well-known "mantle of the expert" approach to education (Heathcote and Bolton, 1996) in which the participants are endowed with relevant expert knowledge in order to take part in a task-oriented activity. It is true, to refer to what Caillois has argued about his *ludus* pole, that the video game

> provides an occasion for training and normally leads to the acquisition of a special skill, a particular mastery of the operation of one or another contraption or the discovery of a satisfactory solution to problems of a more conventional type.
>
> ([1958] 1961, p. 29)

But no matter how many moves and super combos the gamer will be able to learn and execute via the main protagonist Ryu in a game of the *Street Fighter* series (Capcom, 1991–present), s/he'll be incarnating someone that possesses from the outset black belt martial arts skills. In *Tom Clancy's Splinter Cell* (Ubisoft, 2003), s/he'll be playing a well-trained and very agile Sam Fisher (rolling, wall jumping, sliding down on zip lines, making dropping attacks, etc.). In addition, s/he'll become very quickly a "master of unlocking," seeing inside a lock and using a pick to open secured doors. In *Sleeping Dogs* (United Front Games/Square Enix London, 2012), s/he'll be hacking computers and surveillance cameras by having to guess within six attempts a four-digit numerical password in a similar fashion to the classic board game *Mastermind* (Mordecai Meirowitz, 1970). In these instances, and in many others with less simulational complexity, the gamer puts his/her mantle of the expert.

The second general type of conventions is composed of the ones that hinder the gamer's progression and success. In constructing his definition of games, Bernard Suits draws attention to the fact that "[i]t is not that obedience to game rules must fall short of ultimate commitments, but that the means which rules permit must fall short of ultimate utilities" (1978, p. 29). For Suits, "rules prohibit more efficient in favour of less efficient means" (1978, p. 34), and the gamewright's craft revolves around drawing lines not too tight and not too loose with respect to the permissible means. Following Mihaly Csikszentmihalyi's seminal flow theory (1975), one will say that the optimal ludic experience of a video game is known to be reached when the gamer's skills are dynamically balanced with the challenges s/he faces. Inasmuch as one wants to win, one does not want to walk away with an easy triumph. The difficulty levels one can choose from at the beginning of many games meet this aspiration. The antagonization curve follows the improvement of the gamer; either by introducing stronger, faster, or wiser adversaries (whether soldiers or drivers) or by progressively staging confrontation with more numerous enemies. The save points to be found scattered in different locations of the survival horror games played on consoles intensify both the fear of dying and of the need to replay a section from the last save point. Similarly, the save systems allowing only few saved games ask for a better management of progress; a game such as *Dead Rising* (Capcom, 2006), permitting only one save per storage device, makes the photojournalist Frank West's run into the Willamette Parkview Mall much tougher. The maze-like construction of the video game space in general (and the backtracking asked by some games), as well as the labyrinth-like configuration of many puzzles in adventure games, take more time and thought than straight routes or simple reckonings. In order to progress, the various levels the gamer must go through customarily end with a more challenging battle against a "boss," a bigger, smarter, and harder monster to kill; *Shadow of the Colossus* (Team Ico, 2005) twists this convention by concentrating its action on the sole boss battles against 16 Colossi.

Genre Conventions

From a formal perspective, advantageous or disadvantageous conventions remain frequently used techniques and common traits between artworks. First and foremost, the establishment of conventions happens within particular genres, and even within popular franchises. As Julian Kücklich underlines,

> After all, a genre is nothing but a general term for a number of texts with similar characteristics. While these characteristics are not always explicitly formulated, we know what to expect from a first-person shooter or a real-time strategy game, just as we know what to expect from a detective story or a romantic comedy. Aberrations from these conventions are tolerated to some degree, but if they go too far the game will not be accepted as a representative of its genre.
>
> (2006, p. 101)

The latest-released game that is related to a video game genre appears indeed on what H.R. Jauss has called a "horizon of expectations": "The new text evokes for the reader (listener) the horizon of expectations and rules familiar from earlier texts, which are then varied, corrected, altered, or even just reproduced" (1982, p. 23—in line with our previous observation, one will note that it is the term "rule" that is used). The gamer playing the single-player campaign of any recent first-person shooter on the PC will "know what to expect" inasmuch as s/he has started at one point to "look at" a horizon extending at best from *Maze War* (Steve Colley et al., 1974), or at least from *Wolfenstein 3D* (id Software, 1992), *DOOM* (id Software, 1993), *Quake* (id Software, 1996), *Half-Life*, *Halo: Combat Evolved* (Bungie, 2001), *Medal of Honor: Allied Assault* (215 inc, 2002), *Call of Duty* (Infinity Ward, 2003), and *F.E.A.R.: First Encounter Assault Recon* (Monolith, 2005), to name a few popular classics that have led to successful series. S/he will not be taken aback to use the W, A, S and D keys on the computer keyboard for movement and the mouse to rotate the view, fire, and perform actions. S/he will anticipate seeing a gun at the bottom right of the screen and to face a first-person weapon HUD with a crosshair. S/he will be able to read the various visible indicators (current weapon equipped, in-clip and available amount of ammo, health, armor shield, or flashlight) and understand that s/he is hit when the screen flashes red. S/he'll be prepared to go on a linear route and fight his/her way through maps of one-way corridors, rooms, and restricted outside areas. S/he'll know that s/he'll get bigger guns on the way, take the life of many enemies, and that s/he might destroy some supply crates to get ammo and shoot a few explosive barrels for more fire power. Falling in the world of *Medal of Honor, Halo,* or *F.E.A.R.*, s/he will turn to the war, science-fiction, or horror genre to better recognize the theme, the iconography, and plot elements. Actually, the sole rule of this enumeration is the shooting of enemies. No matter how many they are and how smart the artificial intelligence is, the gamer has to annihilate the foes before they kill him/her (player-character). The rest are conventions: the controls' configurations (they can be adjusted to personal preferences), the position of the gun and the indicators, the type of weapon used, the way it is handled, and where the gun battles happen, etc. None of these are fixed, but were set by custom.

The conventions of a genre might become more noticeable when they are not present in a game or, in Kücklich's words, when an aberration is encountered. For instance, *The Orange Box* that the video game developer Valve released in 2007 includes *Half-Life 2: Episode Two* (2007) (along with *Half-Life* 2 (2004) and *Half-Life 2: Episode One* (2006)), *Team Fortress 2* (2007), and *Portal* (2007). If the first two games are typical single-player and multiplayer first-person shooters, *Portal* stands out of the bundle package. The gamer still uses a gun visible at the bottom right of the screen and has to confront enemies represented by turrets. But the gun shoots portals (an entrance and an exit) necessary to make the way out of various test chambers. The action is not based on adrenaline sequences of shooting and sensori-motor skills, but rather on problem solving and cognitive skills. So, while the IGN website classifies the game under the first-person shooter genre, *Portal* is more a puzzle game than a first-person shooter. In this respect, conventions do move from one genre to another so as to widen or renew the experience of a genre. To introduce a famous example, although *System Shock 2* (Irrational Games/Looking Glass Studios, 1999) has everything similar to a first-person shooter taking place in a science-fiction setting filled with horror imagery, the choice of one of the three careers (Marine, Navy, or OSA) and of its first features at the beginning of the game, and the necessary upgrades of characters' statistics, technical and weapon skills, associate it as much with the role-playing genre. And the role-playing games conventions of the video games have themselves been drawn from pen-and-paper role-playing games such as *Dungeons & Dragons* (E. Gary Gygax and Dave Arneson, 1974) and *Traveller* (Marc Miller, 1977).

Narrative and Other Conventions at Play

Given its hybrid nature, and the fact that the video game is as much as cinema a synthesis of previous spatial and temporal art forms, there are many conventions at play that are not specific to the gaming activity. Following the nominal narratology versus ludology debate, the narrative ones remain the most noticeable.

Indeed, not all video games tell stories. But when they do, mostly in the course of the campaign or journey of single-player games, they rely on a prevalent method, that is, on a "typical oscillation between [cut-scenes] and play." Rune Klevjer has well argued that this "[o]scillation is a standard convention in story-based computer games, and my guess is that this form will not go away. On the contrary, it is becoming a new kind of artistic language, developing its own rules" (2002, p. 197). Undeniably, by convention (and not by a rule that would need to be respected), many video games start with a non-interactive sequence introducing the gamer to the world and its characters, and finish with one or many sequences when there are multiple endings. To make reference to Klevjer's defense, cut-scenes during a game can be used as surveillance or planning tools, "gameplay catapults," moments of release from intense action, and rewards. They exploit cinematic codes to elicit emotions and to unravel the plot. The narrative and back-story information are also conveyed through written documents and audio logs the player-character finds along his/her way. Following Henry Jenkins's vision of game design as narrative architecture and Don Carson's notion of environmental storytelling, the stories *take place*. "The organization of the plot becomes a matter of designing the geography of imaginary worlds, so that the obstacles thwart and affordances facilitate the protagonist's forward movement towards resolution" (Jenkins, 2004, pp. 124–125). For instance, while the gamer has come to expect to be able to venture in side-quests besides the main one and to cross different landscapes in the role-playing genre, s/he knows that s/he'll be falling into a dark and claustrophobic world in the survival horror genre.

In the spirit of a projected world different from the real world, the embedded narrative of story-driven games builds on the common spectacular intensification of popular fiction; not many games are structured around everyday routines, as emergent as they can be. The player-character (alone, in co-op with another player, or with various nonplayer characters) embarks on a war against space invaders, on a modern warfare against foreign invasions or insurgencies, on a series of ordered assassinations, on an investigation to solve murders, on a descent into the depths of the criminal world, on a battle to defeat a hellish force or an evil corporation, on a confrontation against monstrous creatures, on an infiltration of secure military bases, on a quest to recover lost artifacts or stolen treasures, on a voyage to find the last heir of a noble family, etc. In the end, the scope of the events goes from the saving of a princess from the grip of a mean opponent to saving the whole universe from destruction. The conflict revolves around the good vs. evil paradigm. No matter the various/numerous forces involved or the sinuous road taken and, above all, regardless of the number of failures (or "game overs") the gamer experiences or how long it takes him/her to progress, the player-character always succeeds (or always ends in defeat in arcade games, where it is a question of how long the gamer can last). An assassination that is meant to fail such as the one at the beginning of the "One Shot, One Kill" mission of *Call of Duty 4: Modern Warfare* (Infinity Ward, 2007) is pretty unconventional. In most cases, further complicating matters occur after an achievement to send the player-character on another track.

Such a study of conventions that are not based on gameplay could be extended to other types. We can, for instance, think about all the audiovisual conventions, the question of stereotypes, the conventional social behaviors in MMOGs (massively multiplayer online games), the language conventions used to communicate online, the conformist practices in the industry, the commonplaces of game conventions or trade fairs, etc. In the end, as for any artwork, conventions are important to the video game. They help the gamer to get into what Arsenault and Perron (2008) have called the "magic cycle" of games, conceptualizing the figure of the circle not in terms of enclosed space, but as a cognitive frame of gameplay and as an ongoing cyclic process of actions and reactions (or inputs and outputs) between the gamer and his/her understanding and interpretation of a video game in the course of time. Since, to reiterate Rawdon Wilson's previous argument, a gamer learns conventions through experience and practice, an exposure to even a small number of games makes him/her familiar with the way certain video games are played and gives him/her a head start. S/he looks forward to these envisaged aspects and conducts because they facilitate his/her gaming insofar as s/he does not have to learn the basics once more, as well as meeting his/her desired experience. On their side, game developers capitalize on this generic and conventional appeal of their games. But the unconventional is obviously as noteworthy. Because conventions change over time, some disappear and others come to be known. This is how new videoludic genres or sub-genres emerge.

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11

GAME DESIGN

Richard Rouse III

What Game Design Is Not

It may be useful to start with what game design is not. Game design does not mean the programming of the game, though the programming powers the game design. Game design does not mean the story or the writing, though they can make the gameplay meaningful. Game design is not the visuals, though the graphics may be critical in defining the readability of the play spaces, or the animations may be tightly coupled with the design of the melee combat. Nor is it the audio, which is often a primary source of player feedback. Game design often needs all of the above other disciplines to function, yet we can think of it as separate from them.

Game design is narrowly defined as the creation of the interactive elements of a game, the rule sets, the gameplay dynamics and systems that run the input–output loop of any game experience.

Game design is the most important aspect of video games because it is the one that determines whether the game is compelling to play, and if a game is not fun/challenging/stimulating/engaging to play in some way, then it doesn't matter how well every other department did their jobs, the game falls apart. Game design is the most important thing to get right in a game, and also the hardest to pull off.

Game systems power the choices players have in the game, whether tactical, progression-based, navigational, or purely timing/reflex-based. In a shooter, for example, many game systems work together to create the overall experience: the way the gun fires and reloads, the logic that dictates the AI enemy movement and attacks, the many systems that control the player's own movement, and the level design that dictates the placement of cover and the enemy's spawn positions for a given encounter. In a strategy game, game design balances the abilities of the different units, comparing them with each other, and defines the attributes that dictate how combat will play out. In a role-playing game, the design dictates which skill trees are best to invest in with a given play style, versus which weapons should be purchased, and in what combination all the pieces can be leveraged to create a balanced plan of attack.

Interesting Decisions and Choices

I have long been enamored of Sid Meier's definition of a game as a series of "interesting decisions" (Rouse III, 2005, p. 27). Meier meant that not only should a game present the player with decisions they have to make (it's obvious to him that it should do at least that), but also that the decisions should be neither trivial (with one clear right answer) nor so difficult that players have no chance of understanding the trade-offs involved. The classic example is the choice of which unit to build at any given moment in a game of *Civilization* (Sid Meier, 1991): in a new settlement, you can choose to build a settler, a scout, or a warrior. Each unit type has benefit at different times in the game, and often there is no clear right or wrong answer about which type should be built. In many cases, success in the game can come from building any one of them. But the player makes a choice based on his/her best understanding of his/her current situation, strategic plans in the game, and so forth. That is an interesting choice.

Many board games offer players interesting choices as well. The choices are interesting because of the multiple players involved in every game, and because most players will not make the same exact choice in every game; though some games, like tic-tac-toe, are so simple that they are not interesting even with multiple players.

Another interesting definition of how a game works and how gameplay is defined comes in the Mechanics/Dynamics/Aesthetic (MDA) framework, as defined by Marc LeBlanc (2004). This framework allows developers and scholars alike to consider games as flowing out of their lowest-level rules (the mechanics), the dynamics those rules create, and the aesthetic/emotional response the player may have. Thinking about games in this way, developers can consider the consequences of the mechanics they choose to use and how they change the feeling of being in a game. We often think of aesthetics in games as being the art, writing, sound, and music perhaps, but what is interesting about this framework is that it suggests the gameplay itself creates an aesthetic, that the nature of the play creates what the game really means.

When Is a Game Not a Game?

By this measure, some genres we often call games aren’t truly games at all. I often bring up the classic children’s game *Candyland* (Eleanor Abbott, 1949) as an example of a game that is not a game. With no meaningful player choice and no tactics of any kind, since the winner will be the one whose path will have been favored by the cards s/he has picked, this game plays out entirely based on random number generation via those cards. Though the game may be fun for children, adults quickly see through the limits of what it has to offer and stop playing it. Winning in a game like that can be seen as meaningless because of the lack of player involvement in the outcome.

Returning to digital games, traditional point-and-click adventure games often rely heavily on puzzles. Puzzles typically do not offer interesting choices, but rather, problems that have only one solution, and where that solution is constant and immovable. Better adventure games offer puzzles that are more dynamic, with multiple solutions, and ones that may change based on other aspects of a game’s current state. But in most cases, these “games” still feel much more like puzzles than they feel like games. As a result, with no real choices at all, adventure games offer little replay value and no room for player improvisation.

Tetris (Alexey Pajitnov, 1984) is often thought of as a puzzle game, and it is, in the truest sense of the word. It is a puzzle that is also a game. It is based on the physical folk puzzle of *Pentominoes* that allows players to place a set of physical blocks into a confined space. *Tetris* takes something that was not strictly a game and adds just enough variety and random challenge to it that it makes the leap into the territory where players have meaningful variety in how they solve it and the strategies and tactics they choose to use to solve it. The randomness of the pieces as they are introduced to the board becomes a dynamic element that transforms it into a proper game.

Another interesting example of non-game "games" comes from the music rhythm genre, titles that are performance-based but which often lack any element of player choice. The measure of success in *Guitar Hero* (Greg LoPiccolo, 2005) or *Rock Band* (Greg LoPiccolo, 2007) comes when the player perfectly recreates the performance of a song that never changes. A few game-like elements exist in the player's ability to deploy "star power" whenever they want to help maximize their score and get through difficult sections of the song, but the tactical depth remains very shallow. The game is more like a single-lane race than something that has meaningful competition against a dynamic adversary that is countering your moves. These games may be fantastically immersive, player-fantasy-fulfilling titles, but it's hard to consider them games due to their utter lack of room for player expression.

Not that there's anything wrong with puzzles or races, but they're not really leveraging what computer games do best: offering players interesting choices.

Who Is a Game Designer?

With game design defined, the role of the game designer is clear: it is creating the game design. As I mentioned before, the person doing this game design, may or may not also do programming, may or may not do artwork, and may or may not write the story. Being the game designer does not mean that person is necessarily in charge of the project, though most of the creative leaders of game projects are game designers by training. Because, as mentioned previously, if the game design is not good, the rest of the game does not really matter.

Of course, most designers don't just do design. Many designers enter the industry as testers, a job that requires the keen ability to play a game thoroughly enough to find problems in both the raw functionality as well as within the gameplay. These are skills that have a reasonable mapping to the analytical skills needed to deconstruct gameplay systems in other games and, in the best cases, figure out how they could be reconfigured to be a new type of game in another experience. Another likely start for many game designers is as level designers. The skills required to construct a fun space are themselves tied tightly to understanding how game design works. Indeed, in many modern shooter and action/adventure titles, such as *Call of Duty 4: Modern Warfare* (Jason West, 2007) or *Uncharted 2: Among Thieves* (Amy Hennig, 2009) gameplay and level design are so closely intertwined that one cannot exist without the other. Finally, many designers thrive in the systems space, documenting how features are going to work and then doing some part of implementing them, from tuning values for combat to actually scripting how AI behaviors chain together.

But of all of these, the most interesting case is the designer-programmer. Coding is the one discipline without which there is no game, at least no digital game. Indeed, without a gameplay programmer who really understands game design and the elusive feeling of "fun," it's unlikely a game will ever be successful. Programming is the oft-forgotten art of games, which is often glamorized more for stunning graphics tech than for a true accomplishment, meaningful gameplay code. No designer can think of every detail involved in implementing a robust gameplay feature, so they are totally reliant on programmers to put all the pieces together. This is why so many successful games have been made by those who can do both design and programming; they have the advantage of both implementing their ideas and making the million small decisions necessary to pull off a great game. So when we talk about what game design is, we must mention the code that is a vital part of the package.

Many larger development teams, at least in Western countries, are spearheaded by someone who is often called the creative director. The creative director is often the lead designer as well, though not always. The creative director is in essence the “idea guy,” who may do no direct implementation work on the title, but who has the crucial skill of convincing people of his/her vision and getting others to carry it out. Often these people have backgrounds in implementation, but sometimes they don’t. They are the closest parallel to the director of a film.

Auteur Theory

One interesting phenomenon of games is that authorship is more muddled than in any other media. In novels, it is clear who is responsible for the work: the writer. In a rock band, the authorship can be shared, but among a relatively small group of people. In movies, more elaborate and sizable productions with many people involved in the creation, the director is widely agreed upon to be the author, even though the role the director plays varies wildly from film to film. Yet, the director is still viewed as the “author” of a film and, when working on set, is typically granted the authority that comes with a certain amount of inherent respect.

In games, however, works tend to be attributed to companies or development teams, recognizing them as the collective authors. There are a variety of reasons for this. Historically, non-digital games had no credits on them; companies such as Milton Bradley owned works outright and wanted people to think of the company as the author of the game for marketing/copyright reasons. This was also true of early coin-op games, which, at first, had no credits on them. Later, in the realm of home video games, companies such as Activision, Electronic Arts, and Infocom went out of their way to promote the authors, realizing that made for a better story in the eyes of the press and the public (and often because those games were made by only a few people anyway). But as games became bigger companies were able to shift the tide back, devaluing the creative visionary to prevent them from leverage recognition into more creative control or higher pay, either at that company or another.

But the point of having that kind of leverage isn’t just salary; it is also creative freedom. If someone is seen as key in the development of a popular game, their name can have marketing value to the public, giving them leverage to use that name to sell a game they want to make instead of whatever the publisher may want. In Western countries, the biggest example of that is Sid Meier. Meier gained respect from his work on flight simulators such as *F-15 Strike Eagle* (Sid Meier, 1985), and when he wanted to do an action/adventure/strategy game such as *Pirates!* (Sid Meier, 1987), his company was able to leverage his name to get people to check out what might otherwise have been overlooked. And when he wanted to turn to pure turn-based strategy with *Civilization*, his “name above the title” status came in handy once again. One can imagine that without his name, those games might never have been made or never have found an audience. Granted, having that creative freedom can also lead to self-indulgent, pompous works, but it can also lead to great, innovative works with a unique voice.

But, interestingly, it isn't only the publisher that is sometimes resistant to the idea that games have an "auteur," but also the other members of the development teams, who may see such posturing by the creative director or design lead as egotistical and somehow diminishing their own contributions. Though the notion that "we all made it together" holds some weight, saying one person was a creative director means just that—s/he was the main decision-maker when decisions needed to be made. Many developers favor the crediting trend of just listing everyone's names without titles, making the "creative director" the same as the "head of QA." Everyone has a warm feeling of collaboration from such listings, even though everyone knows not all the members of the team had the same impact on the design of the title.

A team working together can make a game that is solid, functional, robust, and extremely polished. But only a creative leader can make something that has character, identity, and an opinion, that goes off to truly uncharted territory. Not every creative director/lead designer will do that; in fact, most will fail miserably. But it is worth it for the few cases where we do get a meaningful creative breakthrough.

Game Design as Collaboration

Though we can debate how a team creates a game, we must not forget that games are one of the few art forms where the work basically doesn't exist without player involvement. Though audience participation may be important to a live rock concert, or to an improve troupe that uses suggestions from the audience, games are the preeminent "lean forward" medium, and that is their great strength and their great differentiator.

I have friends and relatives who are not interested in games as a leisure activity. These tend to be adults who work jobs, have kids, or other heavy time commitments, and when it comes to entertainment, they want something that will be easily consumed. And they have a very valid point. Just as a book requires more engagement than a film, games require the most engagement of any medium. Games are not trivially consumed. They require player participation to be completed, and this is fundamental to what they are. This is not to say that games that require maximum focus and engagement (like, say, a really difficult strategy game) are better games than an adventure game that alternates between periods of light engagement with periods of watching. But there is a point where games become so streamlined and lacking in player choice that they stop being games. "Press X to Win" is not meaningful game design.

Within the wide spectrum of digital games, games vary greatly in their level of player involvement. To maximize what our medium can do that other media cannot, it is critical that we leave enough space for players to make the truly interesting choices mentioned above. Players connect more with a game if they are able to put their own personality into it, whether in building options, weapon choices, player character customization, or narratives and spaces to explore in meaningfully unique ways. As a designer, I always love seeing a player who comes up with a solution to a problem or approach to a situation that I had never anticipated, yet that still fits in the world and that the game's systems naturally supports. Games are a unique collaboration between designer and player. As players interpret and shape the story, explore the gameplay systems, or come up with successful tactics that I had not anticipated, I know that the game has finally come to exist as a completed work.

What Is the Meaning of Games?

Having defined game design, shown how game design empowers players, and discussed what a game requires of its audience, we can start discussing the meaning that comes out of the design. What players take away from games is internalized in a completely different way from what we experience in other media. I posit that the meaning of the game comes in the game's reaction to player expression within the game.

One way to explore this meaning is to look at the different ways designers themselves think about the meaning of their games. As the industry stands today, most designers do not have a larger meaning in mind as they work on their projects; they're just trying to come up with a fun experience, whether evolving proven gameplay mechanics and genres, or trying to invent new ones. They're interested in simply providing players with entertainment and pleasure. Many undeniably great and meaningful games have come from designers who were not thinking of the game as having any particular meaning, but who in their pursuit of entertainment could not help but inform the game's systems with their own worldview.

But some designers very specifically bury meaning in their game mechanics. Will Wright, for instance, worked on *SimCity* (Will Wright, 1989) as a fun simulation of a city ecosystem. But as a man of science, Wright made sure the simulation wasn't just fun, but also communicated lessons about how a city functions, for example that building too many highways into your city doesn't work well (Rouse III, 2005, p. 415). Later, in *The Sims* (Will Wright, 2000), he communicated to the team that the game was not supposed to be materialistic, despite surface indications to the contrary. Wright said:

> [W]hen people play it for a while they think it's very materialistic. It's only the people that play it a long time that start realizing the downside. Just about every object has some built-in failure state or maintenance requirement. If you keep buying stuff, it will eventually go bad or die or need to be cleaned or whatever. So in some sense it's like you're filling up your house with all these potential time-bombs … it's the hard-core players that say, "God, I'm not going to buy that much crap next time I play."
>
> (Cited in Rouse III, 2005, p. 453)

Wright's intent was to express a theme of anti-materialism via the game's systems.

Designer Brian Reynolds had a different approach to putting meaning into his games. In *Alpha Centauri* (Brian Reynolds, 1999), he very deliberately built a game that explored the different philosophies that guided several factions attempting to colonize a newly found planet:

> We designed our game/characters/government around the following three ideological clashes: environment vs. business, faith vs. science, and security vs. freedom. We wanted to emphasize moral choices and "the clash of ideologies" make the characters seem more interesting and unique, and have the player's actual gameplay actions affect their relationships with the factions.

(Cited in Rouse III, 2011)

Interestingly, Reynolds said he wanted players to see the benefits and negatives in all the different approaches, learning that none was perfect, and everything had its tradeoffs. He didn't want to create a game where he, as the game designer, was forcing his own personal preferences on players; he wanted players to be able to explore those problems on their own, in the systems he created, leaving them to decide what was "right."

Contrary to the above examples, some games, such as *Tetris*, may be without narrative or moral meaning, but do achieve a more abstract beauty and truth. In *Tetris*'s case, it's a fascinating exploration of the concept of space in a compressed timeframe. Talking about the meaning of a game like this is as elusive and challenging as exploring the meaning behind classical music performance, such as Glenn Gould performing Bach's Goldberg Variations, or architecture such as Frank Lloyd Wright's Taliesin. Yet the work definitely still has a meaning, whether music, architecture, or abstract game.

Writing about Game Design

So then, how do we talk and write about game design? All of the elements of a game are fair play and valid for analysis, and authors have long had strong tools for talking about aspects such as story, art, architecture, and music. But how do we talk about gameplay? "Fun" has long been derided as too general a term, a descriptor that lacks descriptive potential, though some have attempted to better define the word in terms of games (Koster, 2004). But fun as commonly used in society is so general, applying not only to games but also to many non-game pursuits. Someone trying to provide a mainstream game journalism review of a game could use criteria such as progression, difficulty curves, whether the game can be replayed, length and variety of experience, etc. But these terms are mostly useful to make recommendations to other people who might or might not want to play the game, not those who want to understand better what the game means.

We can use established tools from other media to discuss the game's meaning to some extent, but what of the gameplay itself? To me, this unique-to-games meaning comes from analysis of those interesting choices and the way the game reacts to them. What do those choices make the player think about? In *The Sims*, you end up thinking about the nature of possessions and how they affect happiness. In *Civilization*, you may think about the conflict between human growth and expansion versus the preservation of the land, or between war and peace. But what does one think about when playing *Pac-Man* (Toru Iwatani, 1980) or *Tetris* or *Centipede* (Ed Logg, 1981)? Mathematics and patterns, order vs. disorder, consumption, destruction, and the folly of all endeavor as ultimately doomed (since none of these games can be won), all seem possible. As abstract art has meanings that are less tied to the immediate events of our lives or history, so too can abstract games have a meaning that transcends direct description. All game design can mean something, regardless of its form.

Marshall McLuhan famously taught that the medium is the message, meaning that beyond the specific content, a medium itself conveys a meaning (1964). Furthermore, he talked about the differences between hot and cold media. Hot media are so crisp and strong in their delivery that they leave little room for audience interpretation—film is one such example. He said that comics and cartoons were cold media, since they require more investment by the audience. They are abstracted, requiring the audience fill in the details. Games, as I have discussed, require more player participation than any other medium—the game literally does not exist and is not "done" until the player completes it, making interesting choices along the way, filling in far more of the details than film or TV or novels. It may be that the McLuhan scale does not even apply to games. But if we were to imagine how it might, games would be somewhere beyond even cold media in the demands they make on players. And it is the game's design that creates that space for the player to be, to make interesting choices, to fill in even the major details. And within the medium of games there is a great range of "temperatures"—from the somewhat breezy chill of *Half-Life* (Gabe Newell et al., 1998) providing a solidly-crafted, guided experience, yet one still rich with player possibilities to chart their way, all the way to the completely frigidly cold of *The Sims* and *Minecraft* (Markus Persson, 2011), which practically call on players to reinvent the very rules of the game as they play. Searching for the meaning of games is searching for what the game design empowers players to be. That is the true art of game design.

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12

DIMENSIONALITY

John Sharp

Dimensionality is a term used to describe a number of aspects of games: the aspect ratio of a game's imagery; the simulation of depth in two-dimensional images; the simplicity or complexity of a game's narrative; and the decision space a player occupies during their play experience. Each of these forms of dimensionality enriches the play experience of games writ large, and video games in particular.

Game Aspect Ratio

Though it may seem like a subtle point, the aspect ratio of a game is a form of dimensionality in video games. Here, dimensionality refers to the aspect ratio of the play space, which is typically expressed as a ratio of width to height: 4:3, 5:4, 3:2, 16:9, etc. The aspect ratios of video games are almost always tied to those of the displays on which they are viewed and, to a lesser degree, their platforms. During the era of cathode-ray-tube-based screens, for example, most video games adhered to the 4:3 ratio of the screens on which games were played (or 3:4, in the case of the many arcade games that turned the screen sideways). As television and monitor screens transitioned to high definition, the typical console and PC video game shifted toward a 16:9 ratio to match the prevailing televisions and monitors.

4:3

Most early video games were designed to fit within the 4:3 aspect ratio, which is often referred to as "square" even though it is technically rectangular. This is because the viewing effect of these screens is perceived as square. Part of what drove development of 4:3 video games earlier in the game industry were graphics computing technologies. Pixel resolutions of early graphics cards were almost all expressed in 4:3 ratios: QVGA (320 × 240), VGA (640 × 480), SVGA (800 × 600), etc.

4:3 video games have a play space that echoes the televised images people were already used to watching, and so provides an image format players were already familiar with. Early arcade games such as *PONG* (Atari, 1972) used actual televisions as their displays, and golden-era games such as *Pac-Man* (Namco, 1980) and *Asteroids* (Atari, 1979) used similar display hardware.

A variation on the 4:3 aspect ratio, wherein the display was turned on its side (resulting in a

3:4 ratio), is found in many arcade games. *Space Invaders* (Taito, 1978) and *Galaga* (Midway, 1981) were both 3:4 aspect ratio games that turned the cathode-ray display on its side in order to have a vertically-oriented screen. For both games, the top-to-bottom movement of the aliens was better accommodated by the 3:4 aspect ratio. *Mike Tyson's Punch-Out!* (Nintendo, 1984) is an interesting mix of 3:4 and 4:3. The game used two different screens. The primary screen on which the player focused was 3:4, while a secondary 4:3 screen included statistical information on the two boxers' performance and the time remaining in the round.

16:9

More recently, console and PC games have begun to use the 16:9 aspect ratio of highdefinition television. This wider aspect ratio brought about the need to produce games with higher pixel resolutions. The two most common resolutions in the 16:9 format are 1,280 × 720 and 1,920 × 1,080. The 16:9 ratio is closer to the 2.39:1 and 1.85:1 aspect ratios of film. Games such as *Halo 4* (343 Industries, 2012) and *Bioshock Infinite* (Irrational Games, 2013) are designed with the wider screen format, which better creates a cinematic visual experience.

Alternative Aspect Ratios

Not all games adhere to these standard screen resolutions. For example, early games such as *Tennis for Two* (William Higginbotham, 1958) and *Spacewar!* (Steve Russell, Martin Graetz, Dan Edwards, Alan Kotik, Peter Samson et al., 1962) were designed for round screens, giving them an aspect ratio of 1:1. And games such as *Passage* (Jason Rohrer, 2007) and *Gravitation* (Jason Rohrer, 2008) both use unexpected aspect ratios: *Passage* has an aspect ratio of 25:4, while *Gravitation* has a 1:1 aspect ratio. The majority of games with alternative aspect ratios tend to be designed for PC, Mac, and browser-based play. Windowing a game to sit atop the desktop allows game developers the freedom to make their games whatever aspect ratio suits them, so long as it fits within typical pixel dimensions. Anna Anthropy's *dys4ia* (2012), for example, uses a 4:3 aspect ratio even though it is primarily played through a web browser on devices with screens that can accommodate any aspect ratio. The shape of the game was an aesthetic choice made by Anthropy, likely as a reference to early 8-bit games.

Simulation of Depth

The simulation of depth in two-dimensional images is an idea that goes back quite far in the history of visual art. For centuries, West European artists strove to create the illusion of dimensional space; it is out of this desire that linear perspective was developed and codified by the Italian architect Filippo Brunelleschi. For screen-based games, the most noticeable form of dimensionality is that of the simulation of depth, or lack thereof, in the spaces represented on the screen. There are five kinds of simulated depth in games relevant to this essay: two-dimensional; simulated three-dimensional; "2.5-D"; 3-D that uses stereoscopic imaging techniques; and three-dimensional graphics created by twodimensional images (a more complete discussion of the subject is found in Wolf, 2008). Each of these methods not only impacts the appearance of video games, but also the ways players can engage within the play space.

Two-Dimensional Games

Two-dimensional games are those that represent the game world along the horizontal, or x-axis, and vertical, or y-axis, to simulate a flat world. This approach to video game images has been with us since the beginning. Indeed, *Tennis for Two*, an early screen-based analog computer game, and *Spacewar!*, an early digital computer game, both represent a simulated two-dimensional space. On the one hand, *Tennis for Two* positions an implied camera in front of the play space, creating the appearance of a tennis game seen perpendicular to the net. *Spacewar!*, on the other hand, is seen from above the play space, looking down at the two spaceships as they move along a single plane in outer space.

Two-dimensionally-represented video game spaces typically position the play action along a single plane. *Defender* (Williams Electronics, 1980) is a classic example. All enemies, people, and environmental elements are positioned along this plane, creating a clear representation for the player to interpret and act within as their play experience unfolds.

Because all elements in a simulated two-dimensional space are on a single x–y plane, their representations are proportionately sized and positioned within the play space in order for players to perceive all elements as logically organized for their role in the game. In *Super Mario Bros*. (Nintendo, 1985), the top edge of the ground is used to establish the plane along which all play activity will occur. Blocks, pipes, gumbas, coins, and of course Mario, all to appear to move along the implied plane. Mountains and clouds, however, appear in a scale that makes them clearly part of the background, and not elements of concern for gameplay. To some degree, the illusion of planes moving back in depth is created through a combination of color and line. Background elements tend toward more desaturated colors and have thinner black outlines. These visual strategies, borrowed from early twentieth-century animation techniques used in films such as early Disney animation, allow the background elements to recede and draw less of the player's attention.

Simulated Three-Dimensional Games

A similar approach is found in games where the illusion of depth is pre-rendered in background (Wolf, 2008). *Mario Bros*. (Nintendo, 1983) is a useful example; the pipes at the top and bottom of the screen have the appearance of z-axis depth to them, yet they are flat graphics. The illusion of depth is heightened by the seeming emergence of and exit of the enemies from the pipes.

2.5-D Games

Pseudo-three-dimensional games, also called 2.5-D games, create the illusion of threedimensional depth through the use of two-dimensional graphics. Here, there is an implied depth dimension, or the z-axis, that recedes in space in the background. This creates the sense of a deeper play space, and indicates that the play experience will take place on more than a single x–y plane.

In some cases, two-dimensional assets are created that include the illusion of dimensional space, while in others, three-dimensional graphics are used. *SimCity 2000* (Maxis, 1994) is a classic example of the former, where two-dimensional assets create the illusion of depth. An isometric view gave players the advantages of a top-down view and a side view, providing a more interesting view of the objects in the space (Wolf, 2008).

The other version of 2.5-D video games occurs when the game world is produced using three-dimensional graphics, but gameplay is confined to a single-plane space as in two-dimensional games. *LittleBigPlanet* (Media Molecule, 2008) is a perfect example. Though the game world appears to have depth, gameplay is limited to movement first along a single plane, and later along several parallel but distinct planes of activity.

Earlier games such as *Alone in the Dark* (Infogrames, 1992) used two-dimensional environments on which three-dimensional characters and objects were placed. The three-dimensionally modeled and animated player-character appears to move through a dimensional space, though it is positioned atop a flat background. The player-character appears to move freely (albeit slowly) through the space until s/he encounters an object such as a table or a chest. Upon touching the object, the player-character's movement stops. This technique produced the illusion of movement through depth.

"3-D" Games

"3-D" games are those that use stereoscopic imaging techniques that take advantage of the way human vision produces a single dimensional image from the discrete images produced by each of our eyes. The classic example of stereoscopic images is the View-Master (Sawyer's, 1939), which uses two images of the same physical scene shot from two adjacent views that are separately viewed through binocular lenses.

Two early video game uses of stereoscopic imaging are TomyTronic 3D games (Takara Tomy Ltd., 1983) and Nintendo's Virtual Boy system (Nintendo, 1995). On the one hand, TomyTronic 3D games such as *Planet Zeon* (Takara Tomy Ltd, 1983) used two LCD panels that showed slightly different angles on an outer space corridor along which rockets traveled to create the sense of real depth when the player looked through the two viewfinders. The Virtual Boy, on the other hand, used LED screens to create a similar effect in games such as *Mario's Tennis* (Nintendo, 1995) in which the player sees Mario's back as he plays a game of tennis.

Three-Dimensional Games

Compared to other types of games, the simulation of depth in three-dimensional games is more complete, tying the illusion of depth together with the simulation of free movement through the simulated space using the mathematical modeling of three-dimensional environments, characters, and objects. Game engines such as Epic's Unreal Engine or Unity Technologies' Unity3D allow the creation of two-dimensional game environments that represent space that recedes in space.

Instead of limiting player movement to a single plane, or to a series of parallel planes, three-dimensional games allow more open play movement into the depth of the play space. *Crash Bandicoot* (Naughty Dog, 1996) is an early three-dimensional game that provides this open-ended play experience.

The illusion of depth and openness creates a play expectation of freedom of exploration, so the design of the environment is used to indicate where the player-character can and cannot go. The use of walls, cliffs, and sloping surfaces were developed to provide the visual language of which spaces can and cannot be explored. *DOOM* (id Software, 1993) uses three-dimensional models to produce a space that appears fully open and explorable. As a result, the only limitations that appear to limit player-character movement are environmental obstacles such as shut doors, ledges that drop into deep holes, and walls. More recent games such as *Halo 4* (343 Industries, 2012) and *Call of Duty: Black Ops 2* (Tryarch, 2012) create environments that use natural (hills, cliffs, rivers, etc.) and man-made objects to define the play space, creating a field of sorts on which the game takes place. Anything that is not impassable is assumed to be open for player exploration in these games.

Depth of Story World

The depth of a game's story world is the third kind of dimensionality to consider in video games. Depth as a narrative concept is borrowed from film and literature, where it speaks to the amount of information available about a character or a situation the viewer or reader can use to understand and interpret what is taking place. The story world of a game can be quite simple, providing only the most basic context for the goings-on of the game, or complex and nuanced, including meaningful interactions with the game's goals, mechanics, and progression.

The depth of a narrative is impacted by the range of information provided. This speaks to the breadth of the narrator in the case of literature, and of the cinematography and directing (and sometimes, the narration) in film. A novel such as *To Kill a Mockingbird* (Harper Lee, 1962), on the one hand, has limited range, as its story is told from Scout's point of view, a young girl who does not fully grasp what is happening around her; *The Lord of the Rings* (J. R. R. Tolkien, 1954–1955), on the other hand, has greater range because of the narrator's omniscient understanding of the goings-on in the story. The more range a narrative has, the greater the potential for depth.

In the context of video games, range differs from literature, and is closer to film. Games are seen rather than read (with the exception of text-based games, of course), and so the range of information is limited to what we can see, and what we can do. A game such as *Asteroids* (Atari, 1979) provides the player with the full range of information available given the fixed position of the "camera" on the play space. Yet the depth of information is shallow, as all we ever know about the actors—the player's ship, the asteroids, and the two flying saucers—is embodied in their appearance and behaviors within the game. There is no additional in-game narrative context or information available to the player beyond what is on the screen during gameplay. This was supplemented by arcade cabinet art, game packaging, manuals, and other materials around, but not in, a game.

Contrasting with this is a survival horror game such as *Silent Hill* (Konami, 1999). The range of information provided is often narrow, as we only can know what the player-character can see within the expansive game world. Yet the game is much deeper in its development of the player-character, the environment through which the character moves and acts, and the situations the player engages. The use of steep, overhead camera angles combined with tight framing limits the player's ability to see the environment uses limited range to build suspense. The depth of information comes through the player-character's voiceover, the objects encountered while navigating the game world, and through the player's abilities and power as they progress. *Silent Hill* therefore has a greater degree of narrative dimensionality than *Asteroids*.

It should be noted that not all games are intended to provide a story experience. *Asteroids* can be said to have more a theme—a spaceship in an asteroid belt populated by a few alien ships—than a story. *Silent Hill*, however, is clearly a story-driven play experience.

Decision Space

The last form of dimensionality relating to video games is the decision space of a game. The more complex a game's mechanics, goals, resources, etc., and the larger the play space within which the game is contained, the more depth there is to the decision space. The decision space of a game can also be called the space of possibility, a term also popularized in *Rules of Play: Game Design Fundamentals* (Salen and Zimmerman, 2003, pp. 66–67). The basic idea is that a game has a designed space of possible decision points as defined by the overlap of the game's goals, the mechanics of the game, the rules of the game, the resources available, the play environment, and, should it be a multiplayer game, the other players' actions. There are a number of factors that influence a player's understanding of a game's decision space: perfect and imperfect information, progression and emergence, game goals, game mechanics, and player perceptions of available decisions.

Meaningful play is a concept originating in Salen and Zimmerman's *Rules of Play* (2003, pp. 61–67) that elucidates on the quality and quantity of choices a player encounters and makes during gameplay. Qualitatively meaningful choices are those that have a real impact on the player's experience, including their pursuit of in-game goals. Quantitatively meaningful choices are those that provide the player with multiple options for their decision. On the one hand, chess is a game with both qualitatively and quantitatively meaningful choices. Each movement of a token in a game of chess has lasting ramifications for the player's likely success or failure in the game, while there are always numerous options during the game up until the last couple of moves in the game. *Monopoly* (Parker Brothers, 1934), on the other hand, has fewer qualitative and quantitatively meaningful choices as player movement is dictated by the rolling of a die, leaving only the option of buying an available property, or not.

Perfect and Imperfect Information

Perfect and imperfect information are the two kinds of information spaces that games can have. In a perfect information game, all information about the game and its state is made visible to the player. A classic non-digital example is checkers. Everything the player can know about the game is visible on the board, allowing him/her to make decisions with all available information.

Poker is a classic imperfect information system. The initial unknown information comes from the random shuffle of the deck of cards. Which cards will be dealt at any moment is not known. The second cause of imperfect information comes from the cards held by the other players, which the player cannot see. These combine to leave any given player with incomplete information for making their decisions. So a player must weigh the visible information against the unknown information as part of his/her decisions about which cards to play, when and if to bet, when to fold, etc.

Dungeons and Dragons (TSR, 1974) is a different form of imperfect information. Here, information is available through character sheets, through the dungeon master's storytelling, and through the outcomes derived through the rolling of dice.

In video games, things are more complex, but we still have perfect and imperfect information games. For example, *Space Invaders* (Taito, 1978) provides the player with all most all pertinent information, but not all. The player does not know when the flying alien will pass across the top of the screen, or when the aliens in the formation will shoot.

In a game such as *World of Warcraft II: Tides of Darkness* (Blizzard Entertainment, 1996), the maps are known, as are the location of the gold mines. What is not immediately visible, however, is what is found in unexplored terrain, and in unoccupied terrain. Unexplored terrain is displayed as solid black on the player's inset map. Territory that has been explored but that is not currently in the player's primary field of vision allows the player to know the terrain as well as the presence of opponent forces. This use of "fog of war" makes *World of Warcraft II* an imperfect information system for the vast majority of the play experience.

Games of Progression and Games of Emergence

Knowing whether a game is one of progression or emergence also factors into a player's decision-making. These are concepts introduced by Jesper Juul in *Half-Real: Video Games between Real Rules and Fictional Worlds* (2005). Games of progression are those that lead the player along a set path as they move through the game. *Half-Life 2* (Valve, 2007) is a good example of a game of progression. For all intents and purposes, the player moves along a set path as they advance through the game. Though there is some agency for how players go about achieving smaller goals (such as where to hide when taking fire, how many shots to shoot, or the exact path to walk through a courtyard), the larger goals must be achieved in a particular order. Progression-driven games tend to be story-driven.

Games of emergence are those in which the player moves through the play experience in more open-ended ways. *Dishonored* (Arkane Studios, 2012) illustrates this type of game very well. Players can move through the decision space in a fairly open-ended way, achieving goals in the way they see fit. More importantly, the player's actions change the way the game unfolds. Killing more non-player-characters will lead to one type of play experience, while focusing more on stealth tactics in order to progress leads to another.

Games of progression have narrower spaces of possibility due to the constraints placed upon player decision-making by the narrative progression. Games of emergence have broader spaces of possibility because the choices are more open, allowing greater player agency. The greater the space of possibility a game has, the greater dimensionality a game has. *Candy Land* (Milton

Bradley, 1949) can be said to have a shallow decision depth because play is driven by the drawing of color cards from a randomized deck. In contrast, Go has greater depth, as players have greater agency in how they approach each decision in the game.

Affordances

Adding to a player's understanding of what they can and cannot do inside a game is the concept of affordances. Originally conceptualized by J. J. Gibson in his essay, "The Theory of Affordances" (1977), affordances were popularized by Donald Norman in his book, *The Design of Everyday Things* (1988). Affordances are qualities of an object or being that suggest its or their use or abilities. So a hammer suggests its use through its appearance. The handle looks like something we would hold, while the metal ends suggest they are good for hitting things, and prying things. Affordances can further be divided into perceptible, hidden, and false categories (Gaver, 1991). A perceptible affordance is one that can be seen. A hidden affordance is one that exists, but is not visible. A false affordance is one that appears present, but is not actually a property of the object.

In video games, the appearance of an object factors into its potential use and value in the game (Pinchbeck, 2007, 2009). In video games, affordances come into play in many ways—can the player go there, pick that up, climb that wall, jump across that span, etc. *Half-Life* (Valve, 1998) and its crowbar is a classic example of how a video game communicates a choice to a player. Prior to encountering the crowbar, the player sees very little that they might want to pick up. When the crowbar is encountered, it is given a place of prominence to increase the likelihood the player will see it and try to interact with it. *Uncharted 2: Among Thieves* (Naughty Dog, 2009) provides players with clear information on what can and cannot be climbed. In most cases, climbable surfaces have brightly colored "handles" that player can see, and just importantly, perceive as within reach.

The amount and quality of information available to a player, the organization and scaffolding of the challenges a player encounters, and the player's perception of what they can and cannot do within a game all work together to define a game's decision space. The richer and more meaningful the decision space, the deeper a game can be.

Conclusion

These factors all contribute to what a player perceives as their choices when playing a game: what they can see, what they do, and how they make decisions to reach their goals. Dimensionality, in all its forms, is not only a consideration of both the design and development of video games, but also of the qualities and depth of players' experiences. The aspect ratio of a game dictates the game's shape and therefore how the game should be composed on the screen. The method for simulating depth in two-dimensional imagery impacts how a player interprets the game space, and establishes how a player will move and act within a game. The simplicity or complexity of a game's story world impacts the degree to which a player engages narratively with a game. And the depth of a game's decision space factors into the richness of a player's experience.

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13
LEVELS
Martin Picard

A level usually corresponds to a unit of place (and time) in the progression of a game. Each level normally has a setting that differentiates it from previous levels. Sometimes called a map, or even a world, a level is thus a stage in a video game as it is simply a recognizable subspace inside the more general game world. Levels are distinguished by various characteristics: environment, typography, enemies, objectives, difficulties, etc. They are "discrete virtual locations containing tasks that must be accomplished before players can advance" (Laidlaw, 1996, p. 122).

In game design theory, a level usually refers to the different worlds constructed by the level designer that the player must explore and complete in order to finish a game. Level design is a crucial phase in game design. Several designers, critics, and scholars have written about the importance and functioning of the game level design, such as Chris Crawford (1982), Andrew Rollings (1999), Cliff Bleszinski (2000), Steven Chen and Duncan Brown (2001), Richard Rouse (2005), Phil Co (2006), Jeannie Novak and Travis Castillo (2008), and Rudolf Kremers (2009). In his book, Rouse defines the level as such:

> [The level] refers to the game-world of side-scrollers, first-person shooters, adventures, flight simulators, and role-playing games. These games tend to have distinct areas that are referred to as "levels." These areas may be constrained by geographical area (lava world versus ice world), by the amount of content that can be kept in memory at once, or by the amount of gameplay that "feels right" before players are granted a short reprieve preceding the beginning of the next level.
>
> (Rouse, 2005, p. 450)

Level design is much more than the creation of playable maps; it is the consideration of many parameters such as the gameplay in general, the development and progression of the player, or the credibility of the map in the sole purpose of providing a fun experience. In game industry, level design is realized by the collaboration of various trades (designers, programmers, animators, sound designers, etc.) under the responsibility of the level designer. They all must meet the objectives set by the game designer while meeting gameplay criteria.

Level Design and Genre

The peculiarity of level design, and of game design as a whole, comes mainly from the fact that it differs more or less considerably depending on the genre. Each video game genre has its particularity about the design of a game level. Level design does not work the same way as it does for a platform game, an (action) adventure game, a fighting game, or a role-playing game (RPG), just to mention a few genres that have been significant in video game history. Nevertheless, all these genres emphasize the importance of level design as the main creation of the game space. While this space is not always explorable, as in fighting games for example, the use of space by the gamer is fundamental to the gameplay.

Platform Games

In platform games, the main emphasis is on the player's ability to control the movement of his/her avatar. The avatar must normally use platforms (by jumping on them) to explore space. Platform games offer a simple goal that usually requires the completion of several levels filled with traps and enemies to avoid or eliminate. The levels' difficulty increases as the player advances through the game, as well as the enemies' strength, down to the "final Boss." For example, the exemplar of these games, *Super Mario Bros*. (Nintendo, 1985), contains eight different worlds, which are themselves divided into four sub-levels (stages) that must be traversed in order to complete the game (Figure 13.1).

Since *Super Mario Bros*., the genre usually relies on a simple quest to accomplish, stretched across a world many times the size of a screen, represented by side-scrolling, with power-ups (or increased power bonuses) that improve, usually temporarily, the features or abilities of the avatar.

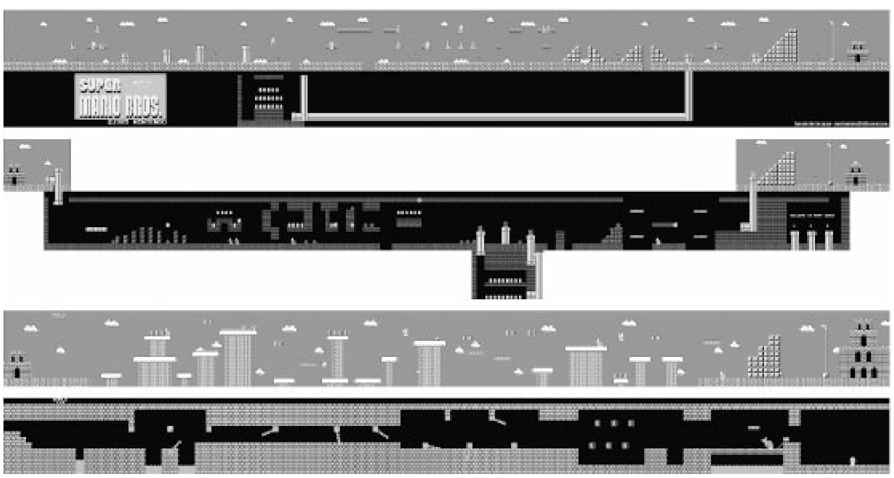

Figure 13.1 The four stages or sub-levels in the first world of *Super Mario Bros*. (1985).

Source: *VGMaps.com: The Video Game Atlas*.

As a very popular genre during the 1980s, platform games have had a great influence in the evolution of game level design, even during the advent of 3-D games, which have mixed platform game mechanics with other genres (such as first-person perspective action games, action-adventure games, etc.). The strong point of this genre, which has helped develop the way three-dimensional space is interactively represented, is based on the gradual unfolding and discovery of the game space and a simple video game mechanism influenced by the theme of the game (the enchanted kingdom of *Super Mario Bros*., the interplanetary travel of *Super Mario Galaxy* (Nintendo, 2007), the interior of a brain in *Psychonauts* (Majesco, 2005), etc.).

Action-Adventure Games

Distinctively, in the adventure game genre exploration and investigation are essential tasks needed to solve the various puzzles encountered in each level. Action-adventure games have added an active dimension (fighting, jumping, racing, shooting, etc.), becoming the most varied genre, as for example in the rich exploration of different worlds and levels in the *Tomb Raider* series (Eidos, 1996–present). This genre is strongly attached to action and adventure movies, hence the highly cinematographic or narrative aspect of most of these games. Since action-adventure games are based on multiple worlds or areas to discover one-by-one and narratively separated in chapters, the division of a game world into levels was a crucial step in the development of game space, from its architectural structure (in which objects are placed) to its aesthetic style.

Fighting Games

Fighting games involve a very different type of level design from other video game genres, since gameplay is based solely on the close combat of two belligerents inside an arena. The space is not a world to explore, but rather a circumscribed area in which the axial movements are the key to gaining the upper hand over the opponent. While space is strongly bound to the execution of combat, it also serves as a thematic structure to position the fight within a particular visual and narrative background, for example, based on the nationality (or other socio-cultural stereotypes) of the enemy that one fights, as is the case in the *Street Fighter* series (Capcom, 1987–present). Even more than games based on exploration, space in fighting games contains visual spectacle, while its static aspect makes this space more of a “tableau” than a level. Developers use clichés associated with each theme represented in order to clearly mark the location and the theme of the fighting environment.

RPGs

The term “level” is also used in RPGs, but with different meanings. It can refer to the degrees of difficulty in the game, to the amount of strength and experience that a character has (a fifth-level fighter versus a second-level wizard), or to the depth of a dungeon (the third level of a dungeon). RPG mechanics are also distinct from other genres. The exploration of a vast space is critical, but space is not necessarily divided into levels. The way the space is designed, whether or not the player can explore every elements of this space, is to convey a sense of openness—a map or territory to explore and unfold. The leveling system, in which characters need to level up in order to beat more powerful enemies, is borrowed from tabletop RPGs. Strongly reminiscent of the tabletop RPG *Dungeons & Dragons* (Gygax and Arneson, 1974), game challenges are mostly in the form of quests, including fighting against monsters (often in a distinct screen or space) and managing an economy of weapons, magic, and party (of controllable characters and non-player-characters). The environments are mostly generic, with the usual dungeons, castles, and medieval cities associated with the genre of heroic fantasy.

The Functions of Level Design

Since level design depends strongly on a game's genre, and thus has a different role to play in each of them, we can infer that level design has three main functions: a structural or architectural purpose (tied to spatial design), a ludic role (defined by gameplay efficiency and segmentation), and a narrative function. These functions are obviously not exclusive to each other, as level design is a complex component of a game system containing multiple layers of meaning, as I will demonstrate by explaining each function separately.

Spatial Design

Like urban space, the possibilities of actions in a virtual world are not without limits. Behind these spaces, there is always a "designer" who places objects in space and creates the settings. In the city, it is the urban planner or the architect. In video games, it is the level designer, in which his/her creative tasks are often compared to the practice of architecture (see for instance von Borries, Walz, & Böttger, 2007).

Lev Manovich (2001) emphasizes two key aspects regarding the question of space in video games: the navigation of three-dimensional space and level structure (pp. 244–273). The video game world of *DOOM* (id Software, 1993) follows the usual conventions of video games by its constitution in a dozen of levels. The game *Myst* (Cyan, 1993), meanwhile, contains different "worlds" (islands known as "Ages") that do not need to be visited in any particular order during the game, making them different from a traditional level structure that implies some kind of progression. In fact, these two games exemplify the two main ways to construct the game world in "levels." As we have seen in the previous section, which also served to underscore the importance of space in game design, while most action and platform games are divided in levels that are quite similar to each other with respect to their structure and appearance, the worlds of adventure and games of emergence, such as *Myst*, are distinctly different. Level design can then be as much the creation of an enclosed and segmented space as an open and exploratory space.

Most action games are still linear, where the main purpose is just to go forward and fight enemies or bypass them in order to accomplish the required objectives. The most effective way to build this type of space is to develop a labyrinthine environment or a map constructed of several rooms or separate areas demarcated by concrete (gates, transportation, etc.) or metaphorical (screen changes or cut-scenes that indicate a new territory or level to explore) boundaries. In order to properly lead the player in this environment, certain areas cannot be accessed or are blocked by "physical" or even "invisible" walls (Egenfeldt-Nielsen, Smith, & Tosca, 2008, p. 97). The action is also scripted, where the passage of an avatar in a specific location triggers a new action (for example, enemies suddenly appearing) or an event (such as a cut-scene). The environment and all the characters encountered during the game (such as the movements of monsters run by artificial intelligence) are thoroughly prepared and planned during level design.

Gameplay Segmentation

As such, a world can't be built in isolation. Every facet of the video game development process is organically interrelated with the requirements of others. In a game, an artist explains in Steven Poole (2000), "[t]he early levels are all meadows and open spaces to get the player comfortable with the character" (p. 212). The terrain is designed expressly to optimize gameplay. Therefore, another crucial step in level design is the design of gameplay. So that the players can immerse themselves in the game world, the entire space must be consistent. There must be a harmony between the objects' dimensions, the achieving path, and the game style.

One of the most fundamental aspects of the game level for the design of gameplay is that it allows a "segmentation of gameplay," as explained by Zagal, Fernández-Vara, and Mateas (2008). *Segmentation of gameplay* is for the three authors a useful concept to capture the function that design elements such as levels, bosses, and waves (of enemies) fulfill in games. Put simply, it refers "to the manner in which a game is broken down into smaller elements or *chunks* of gameplay" (Zagal, Fernández-Vara, & Mateas, 2008, p. 176). Segmentation of gameplay can manage and control the development of the gaming experience through level design:

> Segmentation of gameplay … is not new or particular to videogames. However, videogames have greatly extended the varieties of segmentation, making the concept richer and more sophisticated. Specifically, videogames have introduced new vocabulary referring to gameplay segmentation. For instance, words such as *level*, *boss*, and *wave* refer to particular ways of segmenting gameplay that have become essential in describing and analyzing videogames. These words, however, are also used informally, so that novel forms of segmentation are sometimes conflated under these general terms.
>
> (Zagal, Fernández-Vara, & Mateas, 2008, p. 178)

According to these authors, there are three general modes of gameplay segmentation: temporal, spatial, and challenge segmentation. Temporal segmentation concerns the limitations, synchronization, and/or coordination of the activity of a player during a period of time, while spatial segmentation is the virtual space of the game divided into sub-locations. Some terms used to describe particular forms of spatial segmentation include "levels," "maps," or "worlds," as we have already discussed. The challenge segmentation occurs when the sub-units are presented as autonomous and successive challenges for the player, usually involving a growing difficulty. In an adventure game, for example, a series of puzzles need to be solved by the player to go further, where each puzzle solved allows him/her to encounter a new one. Most (contemporary) games include multiple forms of segmentation that are interrelated and/or occur synchronously.

Regarded historically, the majority of video game worlds were rarely revealed as a continuous whole, but rather as a set of distinct sub-spaces explored separately, even if such sub-spaces have been wider than the screen. Consequently, what is important in determining segments of games is whether these sub-spaces are distinguished as separate places, or if there are any gameplay restrictions or differences between each location. In such cases, the player really has the feeling of traversing the space in parts, and not as an open and unique space. Of course, most actual games attempt now to offer the player the impression of a continuous, unsegmented, and therefore more “realistic” space (for example in the *Grand Theft Auto* series, Rockstar Games, 1997–present, especially since the ground-breaking third installment, *Grand Theft Auto III*, 2001). However, a non-spatial segmentation does not prevent challenge segmentation, while the gameplay division in several distinct missions still gives the impression of game segmentation. In this sense, the notion of “level” is wider than its spatial implementation, since the temporal and challenge segmentation must also be taken into account in designing a game world.

As Zagal, Fernández-Vara, and Mateas also argue, the specificity of the level is reflected in the discontinuity of the gameplay and in the different spaces between each level. Often, the changeover from one level to another is emphasized through the use of transitional screens or cut-scenes. Between two levels, a cut-scene (which will usually advance the plot) is customary, if not the presentation of scoreboards, a save screen, or just a loading screen for the next level. However, this discontinuity must not affect the spatial cohesion, where the art of level design is tied to the creation of diverse aesthetic motifs, which are required to stay in touch with the general theme of a game: “As parts of a gameworld, levels are often grouped together by representational themes, (e.g., ‘ice’ or ‘lava’) or by particular aspects of gameplay (e.g., ‘flying’ or ‘driving’)” (Zagal, Fernández-Vara, & Mateas, 2008, p. 183).

This differentiation fits within a coherent overall structure. For example, as its title suggests, *Super Mario Galaxy* takes place in the outer space. Mario must traverse from galaxy to galaxy to retrieve stars that will allow him to save Princess Peach. Within this general theme, each galaxy that Mario must conquer has its own specific level with its unique aesthetic motifs and game mechanics. For example, in the galaxy “Honeyhive” (the second level of the game), Mario must acquire a bee costume (a power-up) to access flowers and eventually meet the queen bee, who will give him stars. This tool is then used to confront the “Boss” level, a giant insect (Bugaboom) that can be defeated by flying and jumping on his back to crush him.

In addition to their specificity and their aesthetic coherence, the series of levels exemplifies a form of challenge segmentation, since each level becomes increasingly more difficult and usually takes more time to finish. Completing each sequence, one after the other, gives the player a sense of progression. This feeling is particularly evident in the early arcade platform games (that provided exemplars of level-based structure for all the action/adventure games that followed). For instance, in *Donkey Kong* (Nintendo, 1981), each game screen, which is its own level, represents a part of a skyscraper (the game is explicitly inspired by King Kong) where the player, through his/her avatar (Jumpman, which subsequently became Mario), must “climb the building” step by step in order to reach the upper level (the Boss level) where s/he can rescue the princess by defeating Donkey Kong. Since they are all part of the skyscraper, each level is “higher” than the previous one, giving a clear “sense of progression” while maintaining a “sense of spatial relationship between them” (Zagal, Fernández-Vara, & Mateas, 2008, p. 184).

Although levels in games such as *Super Mario Galaxy* and *Donkey Kong* are different, they are still connected by unique gameplay features. The abilities developed when using tools or devices during a level (including power-ups) are normally useful for the following levels. Challenge segmentation, where the player must solve a series of autonomous and distinct challenging situations (perceived by the player as tests or separate tests), is inseparable from spatial segmentation in level-based video games.

Specific forms of challenge segmentation include puzzles, boss challenges, and/or waves of enemies as in *Space Invaders* (Taito, 1978). The most obvious challenge segmentation is the presentation of a series of riddles or puzzles to be solved before the next ones become available. This form of segmentation is common to adventure games, where it is usual for these games to be organized as a series of puzzles whose solutions allow the player to advance in the game world. By contrast, the boss challenge is usually the culmination of the game, representing a unique and highest form of challenge (but in relation with the different skills acquired previously during the game). Beating the final boss, and thus the game, gives the player a feeling of (challenge) accomplishment, but also more often than not, a feeling of (narrative) closure.

Narrative Function

As mentioned by Zagal, Fernández-Vara, and Mateas (2008, p. 195), the technological evolution of video games (directly related to its evolution in both form and content as an increasingly narrative medium) has allowed new forms of gameplay segmentation. Gameplay is now often subdivided into narrative elements, as required by dramatic storytelling (e.g. subdivisions into chapters, acts, scenes, etc.). In addition, the forms of gameplay segmentation already discussed above are increasingly presented to the player in a narrative context. For example, we can easily conceive today of any kind of simulation games with narrative settings. Regardless of the historical period in which a particular title fits, the gameplay can remain essentially unchanged (for example, in a racing game, it consists essentially of the driving of vehicles). However, adding a narrative requirement to the game (as is the case, for example, in the evolution of the *Need for Speed* series (Electronic Arts, 1994–present), especially since the release of *Need for Speed: Underground* in 2003, clearly influenced by the success of the movie *The Fast and the Furious* (2001)), can add not only to the immersion or simply to the fun of the experience, but also to the understanding of the game’s objectives.

The narrative elements of video games, which are mostly influenced by literary and cinematographic counterparts, are usually placed in a specific game level structure. A video game narrative usually contains a general structure or a set of rules that define not only its gameplay, but also its fictional environment as a segmented one, such as repetition of a series of actions in each level (in order to accumulate more points or to master the rules) creating a sense of narrative loops or the unfolding of the adventure story in steps that needs to be completed one by one and in a particular order (with the usual cut-scenes placed at appropriate moments).

During its evolution, the medium of video games has established specific structures in the development of its gameplay (and also its narrativity). The level structure acts as an “architectural block” in the spatial design of a game, as well as a restrictive and segmented structure for the creation of gameplay, and as a narrative strategy for the unfolding of an interactive story. Even if this segmented structure is more difficult to detect today (unlike its explicit presence in early arcade games), it is nevertheless still present. However, the triple architectural, ludic, and narrative functions of levels in video games seem clearly to be evolving towards an “ideal” where the three could—maybe one day—be intertwined seamlessly.

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14

PERSPECTIVE

John Sharp

Perspective is a wide-ranging term in the context of video games. It encompasses a means of constructing images with the illusion of dimensionality; a set of literary conventions relating to the point of view from which stories are told; the visual perspective from which players see a game; a player's perspective for seeing and interfacing with a game; and to the rhetorical perspective embedded in a game's design. This essay introduces each of these forms of perspective.

Linear Perspective

The most fundamental form of perspective is linear perspective, a technique used to create the illusion of three-dimensional space. Linear perspective employs a three-axis grid (horizontal or x-axis, vertical or y-axis, and depth or z-axis) to create a mathematically-derived pictorial illusion of space.

The development of linear perspective techniques during the Renaissance was part of the increased interest in the realistic representation of the visible world in two-dimensional images. The sense that objects appear larger in the foreground and smaller as they move into the distance is based on pictorial construction strategies dating back to early fifteenth-century Europe. Filippo Brunelleschi, a painter and architect, is thought to have developed the technique as part of his creative practice. Art historians have long believed that artists during the Renaissance thought of linear perspective as being akin to a window onto a pictorial world—we see through the flat image and into an imagined space inside it. Though this idea has been brought into question, it is true that the technique was an important tool in the move to authentically represent the visible world and its depth.

Linear perspective techniques are used in all forms of non-photographic image-making—illustration, comics, painting, animation, and, of course, video games. There are three primary methods used to create different vantage points on illusionistically-represented spaces: one-point, two-point, and three-point perspective.

One-Point Perspective

In one-point perspective, a single point, also known as the vanishing point, is placed at the middle of the horizon line. This is used to set the point to which all lines tracing along the depth (or z-axis) of the environment will move. This simulates the sense of lines converging in space if we stood at the center of a road looking into the distance along a long, flat road—the road and its painted lines will appear to converge on a single point on the horizon line.

In the context of video games, one-point perspective is used to not only construct the illusion of depth, but also constrains the player's view of the space. Games using strict one-point perspectival construction tend to set the "camera" on a single line in the extreme foreground of the picture plane just above the floor plane. The camera then is either fixed at a central point on this line, or slides along the line from side to side.

For video games, these techniques are important in both two-dimensional and threedimensional representations of a game's environment. *Street Fighter II* (Capcom, 1991), for example, uses the illusion of receding space to articulate the various zones of the screen and their relative importance to the play experience. The foreground is occupied by the player characters, and is clearly the primary focal point—a slightly receding stage on which the primary game activity takes place. The middle ground, which includes the setting, is of secondary importance. It provides the "set dressing" in which the fight takes place. Finally, the background provides tertiary visual information that is the least important to the play experience, but that still adds to the illusion of a realistic-looking environment.

The arcade game *Moon Patrol* (Irem, 1982) uses linear perspective in another way. The technique of parallax is employed to create the illusion of a player's vehicle moving through a realistically-receding space. Parallax involves receding horizontal planes perpendicular to the depth axis moving horizontally at different speeds to simulate the effect of watching something move along an open vista. The further a plane is down the z-axis (away from the viewer) the more slowly it moves across the screen.

One-point perspective creates a sense of moving into a game's space as well. In *Tempest* (Atari, 1980), the play space is constructed using one-point perspective, which creates the sense that the various elements are moving up the walls toward the player. In *HyperZone* (HAL Laboratory, 1991), the player moves forward toward a single point on the horizon line, even when the player's ship moves from side to side along the horizontal plane. A similar illusion is found in *Galaxy Force II* (SEGA, 1988), a sprite-based corridor 3-D shooter.

Two-Point Perspective

In two-point perspective, lines converge to vanishing points to the right and to the left, and are thus often positioned at an angle from the viewing plane. So instead of creating the illusion of all objects in the image appearing to recede toward a single point, the objects now appear to move off toward points on either side of the horizon line. In *Wolfentein 3D* (id Software, 1992), the camera is locked onto a single vantage point that limits the player from looking up or down. As such, the world is viewed from a two-point perspective throughout game play. Though *DOOM* (id Software, 1993) expanded the design of the environment to include stairs, ramps, and ceilings of varying height, the game still allows movement along the x-axis and z-axis.

Three-Point Perspective

Three-point perspective provides a vantage point that views the constructed world on an angle from both the picture plane and from the ground plane. As a result, objects are seen from above and the side.

This technique is used in isometric games such as *Zaxxon* (SEGA, 1984). The impact on the play experience is noteworthy, as players are asked to mentally rotate the environment in order to determine when to shoot, when to drop bombs, when to dodge enemy ships, etc.

Three-point perspective is also used in 2.5-D games—games that appear to have depth created through the employment of the perspectival technique, but which have static, pre-rendered graphics. *SimCity 2000* (Maxis, 1994) is an excellent example. The fixed camera is positioned 45 degrees above the ground plane.

In games with three-dimensional graphics, this adds the ability for the "camera" to move along both the horizontal and vertical axis, and to swivel both side to side and up and down. *Quake* (id Software, 1996) took full advantage of three-point perspective by allowing the player to tilt the camera up or down, thus changing the vertical angle along with the horizontal angle.

Narrative Perspective

The second fundamental form of perspective for games is that of the narrative. In literature, the narrative perspective speaks to the voice from which the story is told. The places, people, animals, objects, and interactions within the story are understood through the filter of the perspective from which the story is told. In other words, the perspective functions as a filter through which the story is presented. There are four narrative perspectives used in games: first person, second person, third person, and omniscient. Two additional narrative strategies are often employed in video games: the epistolary voice and the unreliable narrator.

First Person

First-person narratives are told from the perspective of one of the characters in the storyworld. This provides us with insights into the character's thinking, their understanding of the goings-on in the storyworld. We "see" the world, its inhabitants, and the events taking place there through the narrator's eyes. As such, we can only know what they know, and see and do what they do. Mark Twain's *Adventures of Huckleberry Finn* (1884) is a classic example from American literature in which the reader experiences the story from the perspective of the main character.

In film, a first-person perspective is often handled through voice-overs. A classic example in film is *Blade Runner* (1982). In the director's cut of the film, there was no voice-over, which rendered the film from an omniscient perspective. But in the studio cut, a voice-over track narrated by Decker, the main character played by Harrison Ford, was added. This turned the film into a first-person narrative.

In video games, first-person perspective operates differently. What differs is that *the player* becomes the lens through which we see the world, rather than through a narrator's recounting. The player is able to control what s/he sees, and within the limits of the game's mechanics, what s/he does. This is one of the fundamental unique characteristics of games as a cultural form.

An interesting take on the first-person narrator voice is found in *Prince of Persia: Sands of Time* (Ubisoft Montreal, 2003). Though the game is seen from the third-person perspective, the story is told through first-person narration. Anytime the player fails to successfully guide the prince through a game play sequence, the prince says something like, “No, no, that’s not how it happened.” This handling of fail states positions the game in an interesting narrative position—it is both first person in the literary sense, but also omniscient, in that the prince knows things we do not as the player about how the story should unfold.

Second Person

Second-person narrative is when the reader is placed inside the story through the use of the pronoun “you” to describe the primary actor. This device was used in *Choose Your Own Adventure* books as it provides an active role for the reader. In games, this method is most famously used in text-based adventure games such as *ADVENTURE* (Will Crowther and Don Woods, 1976) or *Zork* (Infocom, 1979). The world is described for the player, and the player’s place in the game is represented in the second person: “You see a mailbox at the end of a road.” or “You pick up the lamp.” This works well in textbased games, as literary conventions allow the player to occupy an active role within the gameworld.

In graphically-presented video games, what would be called second-person narration—typified by the use of the pronoun “you” in descriptions of character behaviors—would be more readily identified as the third-person vantage point seen in “over-the-shoulder” cameras such as in *Assassin’s Creed* (Ubisoft Montreal, 2007) or *Tomb Raider* (Core Design, 1997).

Super Mario 64 (Nintendo, 1996) has a peculiar narrative twist that makes it technically a second-person perspective, though it is more comfortably a third-person vantage on the world. Lakitu, typically an enemy, becomes the camera operator throughout the game. We therefore see Mario through Lakitu’s eyes. This is more a narrative conceit than anything else, but it is technically the second-person literary voice employed in a game.

Third Person

Third-person perspective is typically narrative presented by an outside voice, someone outside the story who observes or knows about the goings-on inside the storyworld. Third-person address can further be divided into subjective and objective categories. Fairytales such as “Little Red Riding Hood” and “Goldilocks and the Three Bears” are third-person perspective. On the one hand, subjective third-person address allows the narrator access to the thoughts of one or more characters within the story. Objective third-person address, on the other hand, does not allow the narrative voice insights into the thoughts of the characters.

In games, third-person perspective is difficult to identify as either subjective or objective. The play experience is understood objectively through the information provided by the game, but subjectively through the player’s control of their character.

Omniscient

A variation on the third person is the omniscient voice. This is an all-knowing perspective—a narrator who knows everything about the storyworld and yet still resides within it. The omniscient narrator is privy to knowledge unavailable to characters within the storyworld, including waiting surprises, proper interpretations of events, and backstory elements. This additional information provides greater depth beyond what is available in the storyworld, thus enriching the narrative experience.

The omniscient voice is most clearly present in tabletop role-playing games such as *Dungeons and Dragons* (TSR, 1974). The dungeon master is in a position of knowing far more than the players. This differs from traditional storytelling, however, as the player is also a character, and so can only know what is taking place within the game. In video games, the omniscient voice is quite rare, as games intentionally leave the player to discover the story, and more importantly, to generate it through their play.

Epistolary Voice

This is a particular technique for delivering information through written materials—letters, diaries, books, etc.—within a story. In games, this has become a tried-and-true method for providing backstory. *Myst* (Cyan, 1993) provides the vast majority of the player's understanding of the gameworld through books and video letters. In more recent games such as *Dishonored* (Arkane Studios, 2012) and *Gone Home* (The Fulbright Company, 2013), players find notes scattered throughout the world that provide them with information on characters, places, events, and backstory elements.

Unreliable Narrator

A particular spin on narrative voice comes through the unreliable narrator. This is a character or narrator that misunderstands or is confused about the goings-on inside the storyworld. Given the player-driven story progression of games, this is a challenging device to use. Still, there are examples, including *Braid* (Number None Inc., 2008) and *Heavy Rain* (Quantic Dream, 2010). Tim, *Braid's* player character, has the impression that he can undo the mistakes he made that led to the loss of his princess whom he must rescue from a monster. In the end, the player discovers Tim is in fact the monster, and the princess has fled to escape him. And there is a similar surprise at the end of *Heavy Rain*. The unreliable narrator is a difficult literary technique to use in video games, as the player controls the primary character (if there is one), and so needs to sense that s/he is working with actionable information about the goings-on in the gameworld.

View Perspective

View perspective relates to how the player sees the gameworld. In video games, the view perspective ties together the visual construction of the gameworld with the narrative perspective.

There are three visual perspectives: first person, second person, and third person. The view perspective differs from the narrative perspective in that the view perspective is about what is seen, not how the story is told.

First Person

First-person point of view is the vantage point through which the gameworld is seen through the character's eyes. This is the transposition of first-person narrative perspective. This creates a direct connection between the interface—the mouse on PC and Mac games, the left stick in most console games—and the player's ability to see the world.

The traditional approach to first-person perspective in a game was first used in *Wolfenstein 3D* (id Software, 1992) and refined through id's *DOOM* and *Quake*. The player looks out onto the gameworld as if the screen were the player's field of vision. Seeing the gameworld through the player character's eyes has become the primary way first-person shooters present the gameworld to the player. Often, the player can only see their weapon-equipped arm.

Second Person

Second-person point of view is seeing the character through another character's eyes. Because second-person narrative involves a narrator who tells the reader about their actions, we could loosely consider all screen-based video games to be second person. But because the player typically controls themselves within the game, we do not say that games use second-person visual perspective.

Second-person point of view is infrequently found in games. The best examples are tabletop games such as *Dungeons and Dragons* and text-based adventure games such as *Zork* or A *Mind Forever Voyaging* (Infocom, 1985). In a tabletop game campaign, for example, the dungeon master describes the goings-on from a second-person perspective: "As your party walks into the mouth of the cave, you encounter a massive spider inside a pit."

Third Person

Third-person perspective is common in many video games with three-dimensional graphics when the player needs to see his/her character in the context of the play space. There are five primary ways this is handled: over the shoulder, rear view, axonometric, top-down, and front view.

Over-the-shoulder vantage points are found in games such as *Uncharted 2: Among Thieves* (Naughty Dog, 2009) and *Resident Evil 4* (Capcom, 2005). Both use the device of locating the camera in a persistent location over the player character's shoulder, which allows the player to see their avatar situated inside the world while still making clear who the player's character is. This approach models a similar cinematographic technique for making clear the primary character in a scene.

Massively multiplayer online games, including *World of Warcraft* (Blizzard Entertainment,

2004) default to a third-person perspective that places the camera behind the character (though players can also opt to see the game from a first-person perspective). This has the effect of creating a clear focus on the player character, while providing a more comprehensive view of the gameworld. It also creates a sense of separation from the character, almost making the avatar more of a "puppet" in the player's hands.

Axonometric view games use a similar technique, though even further pulled back. In games such as *Crystal Castles* (Atari, 1983), the player's avatar moves throughout the game space that needs to be seen as a whole. And so the player is given a fixed vantage point above and at an angle to the vanishing point. Axonometric is also used in *Advance Wars* (Nintendo, 2001). In this case, the player needs to see a large swatch of the gameworld in order to keep up with numerous player-controlled resources.

Real-time strategy games such as *StarCraft* (Blizzard, 1998) and *Civilization V* (Firaxis Games, 2010) use a third-person perspective as well, though with the camera pulled back much further to expose the player-controlled elements in an equal way to elements controlled by either other players or by the game itself.

Top-down or overhead games such as *Tank* (Atari, 1974) have an even more pronounced separation between the player and their representations in the game. This from-above vantage point creates an objective view of the gameworld.

Front-view games such as *Space Invaders* (Taito, 1978) use a similar visual objectivity, but with the player looking out at the gameworld instead of down at it.

Player Perspective

The construction of the world, the point of view from which the story is told within the game, and the vantage from which the player sees the world, all build the player's perspective on a game. Even the simplest video game is framed by these interlocking elements to build up who the player is, what s/he does, and how s/he feels during the play experience.

The player's understanding of himself/herself is constructed out of a number of elements: the way the player is represented (via an avatar, as a controller of elements, etc.); what the player can do (e.g. shoot, run, climb, pick up, etc.); the micro- and macro-goals assigned to the player (climb the wall, eliminate enemies, save the princess), among other criteria.

Who the Player Is

The character or role the player assumes—a space marine, an archeologist, an elf, a god-like controller, a plumber, a rocket ship—is one important layer of framing inside the game. This provides the player perspective on what s/he can expect to be asked to do, how s/he can achieve those goals, and ultimately whether or not s/he perceives a game to be something s/he will want to play or not. There are many approaches to constructing a player's understanding of who s/he is in the game. These include the visual characteristics, through the attributes they have, through backstory, and through in game narrative elements.

The avatar appearance creates certain expectations in a player. Lara Croft, for example, suggests she will be strong, athletic, and prepared for outdoor adventures based on her physical appearance and attire. In role-playing games, a character's abilities are visually represented. A character with a long sword or an axe would be reasonably interpreted to be best suited for hand-to-hand combat, while a character with a bow or musket would be assumed to be best for long-range combat.

Story as well shapes a player's expectations of who s/he is within the game. *Assassin's Creed II* (Ubisoft Montreal, 2009) begins with a scene that establishes the player character as Desmond, who is transported back in time via the Animus to assume the role of his ancestor Ezio. In *Half-Life 2*, the player learns about Dr. Freeman's reputation as a scientist and respected resistor through non-player character interactions.

What the Player Can Do

The actions the player can carry out during a game provide the next layer of perspective. Given who the player is inside the game, the next thing to understand is what they are able to do. Can they run, jump, shoot, climb, throw, pick up, or cast spells? In games, a player's understanding of their experience is through the actions s/he carries out, and the impact s/he has on the game state, and their progress in moving through the game. The player character's abilities at once expand the visual cues and the narrative devices and build upon them by establishing an action vocabulary for the player.

The crowbar in *Half-Life 2* (Valve, 2004) is a classic example. The player begins the game with only the ability to walk and look. Before too long, the player encounters a crowbar, which teaches the player how to interact with objects. Once picked up, the crowbar adds a new ability: smashing things.

What the Player Is Asked to Do

The goals of the game provide another layer of perspective. Is the player asked to save a princess? Seek out treasure? Save the world? Investigate some aspect of the game designer's life? The goals the player is asked to achieve provide the third layer of player perspective.

To ensure the player understands how to use their crowbar in *Half-Life 2*, the player is put in a situation in which further progress is impossible until the crowbar is employed.

What the Player Feels

These layers of perspective help generate the player's emotional response to the game; and the emotional response, whether it be celebratory, happy, frustrated, angry, or otherwise, colors the player's perspective on their play experience. If, in *Half-Life 2*, the player is asked to do something that seems beyond the player's perception of their ingame abilities—to take down the first antlion guardian or strider s/he encounters, for example—then s/he is likely to feel a range of emotional responses. Initially, the player will feel determination, perhaps uncertainty. If s/he accomplishes the task, s/he will likely feel elated, or satisfied, or a similar positive emotion. If s/he fails the task, she is likely to feel frustration, anger, sadness, or even resolve to try again.

Rhetorical Perspective

The player perception is framed by the rhetorical perspective embedded in the layers of a game. Rhetoric has roots in classical Greece where it was seen as the art of persuasion. Rhetoric has since expanded to define the perspectives embedded in a text—whether that be a speech, a poem, a song, a film, a painting, a game, or any other form of expression. In looser terms, when we speak of someone's "agenda" or "point of view," we are speaking of their rhetorical perspective.

In modern usage, there are two layers of rhetoric inside of communications—that of the message, and that of the medium or cultural form through which the message is delivered. And so if someone wants to convey a rhetorical perspective about something through song, s/he will have certain tools made available for rhetorical affect—e.g. tempo, rhythm, melody, etc.—while others will not be available due to the constraints imposed by the form of music.

Though rhetoric has been around for thousands of years, it is only recently that we have begun to think about the rhetorical perspective of games (Bogost, 2007). Games have certain properties that can be used for creating a rhetorical perspective: systems, mechanics, and narrative. Rhetorical perspectives can be found in all games, but serious games are the most prevalent type of game in which developers attempt to embed a persuasive argument in game-form.

Systems

The rhetorical perspective of a game begins with the underlying systems embedded in the game. In many games, the systems are abstractions of real-world phenomena—*McDonald's Video Game* (Molleindustria, 2006) models the production and distribution of the fast food chain McDonald's products, while *The Cost of Life: Ayiti* (Gamelab, Global Kids, 2006) abstracts the cycle of poverty in Haiti. The real-world phenomena are abstracted down to a tangible set of interconnected elements, each of which has attributes that operate toward a particular outcome.

Any modeling of a system is going to include opinions about the phenomena it represents. *McDonald's Video Game* sees the means by which McDonald's sources, produces, markets, and sells its fast food as bad for pretty much everyone but the company itself; *Ayiti* puts forward the argument that education, though hard to obtain, is critical to breaking the cycle of poverty for underprivileged Haitians.

In a game, the rhetorical perspective is put in motion by players who engage with the system through the permitted procedures or actions. A game's developers can model the underlying system(s) of a phenomenon in many ways, but what happens in all cases is that certain elements are excluded for the sake of simplification. And so while the *McDonald's Video Game* could have allowed players to plant flowers in addition to soy, or to raise alpaca instead of cattle, the game limits the players to either using land for raising soy crops or cattle herds in order to more clearly make its point.

Goals and the Space of Possibility

The rhetorical perspective of the game becomes most legible through play, based on the actions a player can enact in pursuit of the goals outlined by the game through win states, achievements, and other mechanisms for measuring player performance. The goals set up within a game lead players toward particular interpretations of the systemic representation. And so the goals of the game suggest proper ways to act within the system. *Ayiti* suggests that educating the children of your family is optimal whenever possible, and finding higher paying jobs for the adults is the best bet.

Ludonarrative Dissonance

The layers of rhetorical perspective within a game are difficult to align into a coherent, legible whole. One of the ways in which they do not always work together is when the game's systems, mechanics, and narrative fail to work together. Clint Hocking (Hocking, 2007) coined the phrase "ludonarrative dissonance" to speak to this phenomenon in his review of *BioShock* (Irrational Games, 2007). As Hocking notes, the game's theme was purportedly about free will, yet the player character was more or less a puppet of a never-seen character, Atlas. This created a dissonance between what the player does—move through the world killing splicers and key non-player characters under the direction of Atlas—and the game's theme.

Conclusion

It is through these four types of perspective, introduced in this essay, that a player's experience is in large part framed. Indeed, what the player sees, how the story is presented to him/her, the role s/he plays within the game, and the rhetorical point of view presented through the game's play, are all very important tools for the design, play, and interpretation of video games.

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15

SOUND

Mark Grimshaw

Introduction

The very earliest video games were precisely that: games utilizing one sensory modality only, that of sight. Unlike developments in cinema, which took several decades from its commercial beginnings to develop a viable and reliable sound system, sound in mass-produced commercial video games was present from the start—in the arcade machine *Computer Space* (Nutting Associates, 1971), which was closely followed by *PONG* (Atari, 1972), whose monotonous, monophonic beeps rapidly became established as a synecdoche for video games—although the first home console, the Magnavox Odyssey of 1972, did not have sound. The circuit boards the arcade machines were built upon had the innate capacity to produce tones and this aided the faster implementation of game sound when compared to the implementation of film sound. Since then, rapid developments in digital technologies have created new ways to design and utilize game sound and this, in turn, has led to developments in the player experience of and relationship to game sound.

The relationship between player and sound was initiated by *Computer Space*'s and *PONG*'s simple use of sound cues to indicate to the player the occurrence of important game events. Collins (2008) points to the presence of the repetitive, musical chugging of *Space Invaders* (Taito, 1978) as an early instance of a more sophisticated relationship; the longer the player survives in the game, the faster the music becomes (along with the aliens' movements).

Video games operate through various sensory and perceptual modalities of which, currently, the most important are vision and hearing. Sound, though, is capable of depicting events and spaces beyond the confines of the screen to a greater extent than image. Combined with the localization function of sound, the importance of sound to the positioning of the player within the game world cannot be underestimated. This is particularly true in first-person perspective video games where, for example, enemies or rival cars can be heard coming from behind before they are seen.

Mention must be made of a special class of game that simply would not exist without sound: audio-only games. These, of course, are not video games but audio games that might be better classified as computer games. There is a wide variety of genres of audio-only games some of which replicate with sound certain video game genres; for instance, the audio-only version of the first-person shooter video game *DOOM* (id Software, 1993), and other games found at www.audiogames.net.

Throughout this study, *diegetic* is used to describe those sounds arising out of the internal logic of the game world whereas *non-diegetic* refers to all other sounds. This essay begins with a brief survey of the functions of video game sound and then moves to a short summary of the development of game sound technology. Theoretical and empirical issues are assessed in the subsequent section before the essay concludes with a look to the future.

Functions of Video Game Sound

A number of different game genres demonstrate different experiences particularly where those experiences, and thus relationship to sound, help to elucidate the subsequent sections on game sound technology and various theoretical and empirical approaches to game sound. Although this section categorizes game sound as film sound is often categorized (namely dialogue, music, sound effects, and ambient sounds) and although it often draws comparisons between the two, it should be stressed that game sound is not film sound. The former is typically and fundamentally interactive, real-time, and produced according to the actions of players whereas the latter is usually non-interactive, fixed, and unchangeable.

Dialogue

Given technological limitations, such as storage constraints and difficulties in dealing with non-linear aspects of games, the game dialogue or speech that is used in some video games typically has a different role than that of film dialogue. Nevertheless, game dialogue has some functions in common with film dialogue. For example, the accents and dialects of game characters contribute to the mise-en-scène and, in certain genres, aid in identifying friend or foe (Collins, 2008), while the presence of dialogue can indicate the level of attention of game characters toward players (Jørgensen, 2009). Additionally, the emotive quality of such utterances contributes to raising or lowering tension in the game.

As with voice-over narration in film, game voice-overs are an aid to understanding game characters and plot as well as a means to move the action along. In video games, though, such devices can also provide tasks and objectives for the player. Another important function in some multi-player games is communication between team members, making use of voice-over Internet technology, which has become increasingly feasible as Internet bandwidth improves.

Music

Following film sound theory (Chion, 1982, 1994), music in video games is typically described as non-diegetic, and comprises an underscore that often runs throughout gameplay. As an underscore, music is intended primarily to serve emotion and any game narrative. Today's video games can come with fully scored, orchestral compositions to rival any mainstream film. The increasing rapprochement between film composing and game composing is evidenced by the number of film composers who also write for games (e.g., Michael Giacchino whose credits include the *Medal of Honor* series (Electronic Arts, 1999–2006) and Mission: *Impossible—Ghost Protocol* (Brad Bird, 2011)).

Such music serves other purposes. Not least is the use of popular music where, although some music is commissioned specifically, the game provides a platform to re-present existing music tracks by established artists (e.g. *Wipeout* (Psygnosis, 1995–1996)). Music can also provide a means to attract customers' attention. This is particularly the case with video games placed in noisy arcades where they must compete to earn the punters' cash (Collins et al., 2011). In some video games, music can be a vital diegetic component of gameplay and the music game genre is the prime example of this. Here, the attraction of playing is derived from the pleasure and satisfaction of music-making. Thus, the player "composes" throughout the gameplay of games such as *Rez* (United Game Artists, 2001) and *Aurifi* (Four Door Lemon, 2010); musical compositions are built up from pre-supplied musical snippets or loops through the skillful navigation of game objectives by the player. In other music games, such as the *Guitar Hero* series (RedOctane and Harmonix Music Systems, 2005–2010) and *Rock Band* (Harmonix Music Systems, 2007), the player performs music, often on an external, customized musical instrument, or sings through a microphone in order to score points according to musical ability.

It can be difficult to ascertain where non-diegetic music stops and diegetic sound effects take over. Whalen (2004) draws upon the kinaesthetic practice of "Mickey Mousing" (or isomorphic music (Curtiss, 1992)) in many early animated films to point to some of the functions of music in cartoon-like games. The musical score rhythmically and/or melodically mimics the on-screen action. This practice typically occurs in games with a similar aesthetic to those of *Super Mario Bros*. (Nintendo, 1985). For instance, when the character Mario jumps in the air, the player hears one of a variety of ascending *glissandi*. Whalen suggests that such isomorphic music imparts life and anthropomorphic qualities to the virtual characters.

Sound Effects

Non-diegetic sound effects usually involve menu interface actions outside of gameplay. The timbre and form of these sound effects often conform to the sound sets used during gameplay and thus help set the scene for the game, but their main function is merely to confirm the user's menu actions.

Sound effects in video games are typically diegetic, though, and are triggered by events occurring during gameplay. These events can be actions of the game's characters or important game events requiring the player's attention. Their sounds, depending upon genre, can include footsteps, radio messages, gun-shots, car engines and tires screeching on various surfaces, balls being kicked or hit, flesh being punched, and referees' whistles.

What typically characterizes these sound effects is that they conform to a realism of action; *do a sound, hear a sound* (a play on the film sound design mantra of *see a sound, hear a sound*). Many such sounds will be authentic (actual recordings of the sounds produced by those events) or, at the least, will be verisimilitudinous. This latter state derives from the cinematic practice of dubbing sound effects and, in particular, the use of Foley sound effects whereby a sound effect is used that approximates the sound that would be produced by the event depicted on the screen. Through synchronization and realism of action, the sound *becomes* the sound of the depicted event. Sound effects can, however, also be fantastical; for example, platform game sounds or role-playing fantasy games sounds for events not occurring outside the game world and, over time, these become no less believable as *the* sounds of those events.

Ambient Sounds

Many video games, particularly those with elaborate and wide-ranging game worlds such as action and adventure games, make use of ambient sounds that occur in different parts of the game world. They are not triggered by game or player events (other than that the player enters that particular space in the game world) and often derive from sources that are not depicted on screen. Such sounds might include the surrounding sounds of battle, wind through the trees, wolves howling, or birds singing.

A large proportion of ambient sounds work with image, plot, and narrative in a variety of functions devoted to the mise-en-scène of the game world. For instance, a large physical space depicted on the flat, two-dimensionality of the screen might be enhanced by the use of reverberation or sounds from off-screen. Ambient sounds can also depict diurnal rhythms such as those sounds of fauna that become heard as day changes into night in *Red Dead Redemption* (Rockstar, 2010).

Technologies of Video Game Sound

Today's video games utilize multiple diegetic sounds that are recordings of sounds in the real world or are specially designed, fantastical sounds crafted to match the effects or ambience of a game world's mise-en-scène. Modern video games also have non-diegetic musical accompaniments that may be either pre-recorded tracks or stored musical scores that are produced anew at each gameplay. Developments in game technology led to new relational possibilities between player and sound and it is these developments that will be summarized next.

Since the circuit board used for *PONG* had no dedicated sound generators, a video sync generator was used to produce the game's synthesized tones. Through the 1970s, arcade machines following *PONG* had to compete with each other in a noisy environment (Collins et al., 2011) and, soon, dedicated synthesis chips were added to these games (as well as to home consoles). These allowed for a wider range of timbres and volumes, greater polyphony, and the use of computerized musical scores to supplement the sound effects with strong, thematic tunes that broadcast their siren call to arcade customers with an ever greater stridency.

The introduction of MIDI soundcards into home computers in the late 1980s, and the growth of gaming on those machines, gave rise to more ambitious music and an increase in the use of audio samples (digital recordings of sound). Such soundcards dramatically increased the palette of timbres available and permitted more voices to be sounded simultaneously (e.g. the Soundblaster *AWE32* of 1994 had 128 pre-set instruments with 32-voice polyphony), allowing musical scores, programmed into the game software, to approach the complexity and density of symphonic works.

The use of audio samples was taken further in the early 1990s with the use of large-capacity, digital storage media such as CDs. Today, thousands of high-quality audio samples can be stored allowing developers to introduce greater variety to sounds once limited by small storage capacity. Multiple recordings of footsteps on a variety of surfaces, for example, or a large number of car engine sounds now provide the player with a vastly increased range of sounds when compared to video games of the 1970s and 1980s.

Game audio engines of the mid-2000s (e.g. Valve's *Source* and Crytek's *CryEngine*), introduced the real-time processing of audio samples. As the player moves through the physical spaces of such games, sound effects are processed with reverberation to approximate the reverberation characteristics (sound perspective) of such spaces and to improve the realism of the soundscape; but even with the increased storage capacity of optical media, game designers still cannot offer the same variety and range of sounds that are heard in the real world.

Theoretical Considerations and Empirical Research

Video game sound performs many functions but all relate in some fashion to the player of the game. Sound, together with image, plot, narrative, and other social activity surrounding the game, helps the player to engage with the affordances offered by the game's software and hardware and, thus, to take part in the game world itself. Most theoretical consideration and empirical research on video game sound is concerned with the relationship between player and sound but approaches it from different angles.

A number of authors have considered the place of sound in the game's diegesis. Much of this thinking is a development of film sound theory (e.g. Chion, 1982, 1994), but taking into account the highly interactive nature of video games when compared to cinema, while other thinking develops the environmental soundscape theories of Schafer (1994). Grimshaw (2008a) proposes a number of instances of diegetic sound (for example, kinediegetic and telediegetic) to describe the role of sound in first-person shooters, both single- and multi-player, while Jørgensen (2009) gives us the term transdiegetic as a means to understand the functions of some game music which, initially, might appear to be non-diegetic.

Another area of theory concerns itself with engagement, particularly immersion, in the game world and how sound facilitates this. Such a topic is of interest generally in virtual environments not least because of disagreement as to what is immersion (despite the claims of game publishers that their game will immerse you like no other). Several authors discuss immersion (and the related concept of presence) with regard to virtual environments in the general sense (e.g. Brenton et al., 2005; Waterworth & Waterworth, 2014) and immersion in video games (e.g. Calleja 2011, 2014; Jennett et al., 2008) but only a small number directly deal with immersion as it relates to video game sound. Of these, Ward (2010) makes use of Barthes' (1977) concept of the grain of the voice to analyze player immersion through the embodying of voices heard during the playing of *BioShock* (2K, 2007).

Emotion has been argued to be a key component of player immersion and Ekman and Lankoski (2009) investigate the uses of sound in survival horror games to engender fear and thus engage the player. Murphy and Pitt (2001) discuss the use of spatial sound to enhance immersion in interactive, virtual environments whilst Jørgensen (2006) argues that realistic audio samples make the game more immersive. In a number of articles, Grimshaw (e.g. 2008b, 2012) analyzes the sound of first-person shooters, particularly where the ability of the player to contribute sound to the acoustic ecology of the game (the triggering of audio samples through player actions and presence in the game world) is a key factor in player immersion in that ecology and, thus, the game world.

A number of empirical studies have addressed the effect of video game sound on player perception and psychophysiology. Some of this relates to the reception of game sound by consumers; for example, Wood et al. (2004) found that sound was amongst the most highly-rated features of video games. Other studies investigate the effect of sound on player performance showing a deterioration in the absence of non-diegetic music and/or sound effects (e.g. Nacke, Grimshaw, & Lindley, 2010; Tafalla, 2007) although yet other studies on non-diegetic music contradict this (e.g. Cassidy & MacDonald, 2009, 2010; Tan, Baxa, & Spackmann, 2010).

There are several studies that assess the effect of sound on the player's psychophysiology. Results are mixed, particularly for quantitative, physiological studies. Some studies have shown no significant psychophysiological effects in the presence of sound (Grimshaw, Lindley, & Nacke, 2008; Nacke, Grimshaw, & Lindley, 2010; Wolfson & Case, 2000), while others *have* found significant effects (e.g. Hébert et al., 2005; Tafalla, 2007). For an overview of psychophysiological methods and empirical studies in the context of video game sound, see either Nacke and Grimshaw (2011) or Grimshaw, Tan, and Lipscomb (2013).

The Future of Video Game Sound

In the few decades since sound was first introduced to video games, it has developed from simple, monophonic synthesized tones to complex musical arrangements and the use of multiple, high-fidelity audio samples with some game audio engines able to process sound effects according to the player's position in the game world. Although predictions are risky, a number of approaches to the design of game sound may be put forward that point to possible developments.

These approaches use new technologies and computational methods to affect the player's relationship to sound. Video game sound first involved real-time synthesis, before moving to MIDI and the use of audio samples, and it may be that increasing computational power will allow a return to real-time synthesis using the developing field of procedural audio. Such an approach creates greater variety of sound at a fraction of the storage cost required by audio samples; coupled as the procedures are to precise assessments of the game world's materials, spaces, and characters, this is likely to further enhance player immersion because such subtle variety is closer to our experience of sound outside the game world (see Farnell, 2011).

Other technological developments open the door to real-time synthesis or processing of video game sound according to the player's psychophysiologicial state. Commercially-available headset devices that monitor that state through electroencephalography and electromyography are likely to become increasingly utilized especially where they allow game audio engines to monitor, and immediately respond to, the player's emotional and affect state (e.g. Garner & Grimshaw, 2011; Grimshaw & Garner, 2013). However video game sound develops, it will almost certainly be in a manner that more closely, and in real-time, integrates video game technology and the player.

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16

WORLDS

Mark J. P. Wolf

Like novels, narrative films, and television shows, many video games can be said to have a diegetic world, that is, an imaginary or fictional world in which game events take place, and where the game's characters live and exist ("world" is used here in an experiential sense). Usually such worlds are made in support of a narrative, though worlds do not necessarily have to contain stories, and not all of them do. Video games such as those of the *Sim* series (Maxis Software/The Sims Studio, 1989–present) and other sandbox games allow players to build imaginary worlds, within certain limitations and restrictions, but there is no predetermined narrative that occurs there, though the player's experiences and interaction within the world may constitute something like a narrative. The world and its design often is closely connected with the design of the game, since exploring the world (navigation) and learning how the world works (including everything from its machinery to its ontological rules and its physics, which can differ from the actual world) are both often a substantial part of what occurs during gameplay, and part of a game's objectives and goals.

Space, Time, and Causality

As the action of most video games takes place in a virtual space over time and features some sort of causality, the settings in which games take place are often referred to as "game worlds," and as such, they have a place in the history of imaginary worlds. Video game worlds are necessarily composed of several things: some kind of geography, inhabitants, action, and logical consequences that are the outcome of actions. Every game world has some kind of space in which the game's action takes place, from simple blank playing fields that are a single screen in size (as in many early arcade games), or a verbal description (in the case of text adventures), to vast, elaborately detailed worlds with hundreds of thousands of players (as in massively multiplayer online role-playing games (MMORPGs)). These areas are displayed on-screen, and many games, especially adventure games, require exploration of the game world, where other characters are encountered, objects are found, and quests are completed. Sometimes the revelation of game world space is the game's main objective, though it is more likely to be a sub-goal required by other game goals. In many games, especially those with three-dimensional graphics, there is usually some sense of what lies beyond the game world space that the player's avatar can actually visit, conveyed by backdrop imagery (which depicts an extension of the game world out to a distant horizon) that is placed around the edges of the active game area. The indication that a world exists beyond what is seen on-screen is conveyed through such things as maps, as well as through methods borrowed from cinema, such as off-screen sounds, off-screen light sources, and events that occur offscreen and are discovered by the player later in the game.

The inhabitants of a game world include the player's avatar (or avatars), the avatars of other human players, and the non-player characters (NPCs) controlled by the game programming. All characters, whether avatars or NPCs, usually have some sort of purpose, motivation, and goal-orientated behavior, which may help or hinder that of the player's avatar (or the player's intervention, as in the case of sandbox games where the player does not control an avatar directly). Characters initiate action within the game world, although action can also be initiated by the game program's direct control of the game world itself; for example, changing weather conditions, a diurnal or seasonal cycle, or events such as earthquakes or tornadoes (as in *SimCity* (Maxis Software, 1989)). Quite often the action of the game world's characters directly affects the state of the game world itself, and a particular game world state may even be the game's objective (for example, the destruction of an evil empire, or restoration of a ruler or magical object).

Finally, a game world will operate according to some logic that it uses to assign consequences to actions taken by the game world's characters. These consequences usually are consistent and can be expected in advance once the player learns how the world works. Through knowledge of these consequences, players can make gameplay choices that move the game world's state in a desired direction. The game world's logic determines much of the gameplay experience, and may also shape the look and feel of the game world itself, suggesting guidelines for design aesthetics. Other aspects of the game world controlled by the game engine include the physics of game events, the automatic positioning of the implied camera that controls the player's point of view, artificial intelligence (AI) controlling NPCs, and the player's interaction with the world. Learning how these things work is often important to gameplay, and knowing how events and decisions are generated may help the player predict some games events in advance or at least be ready for them when they occur.

Video Game Worlds and the Imaginary World Tradition

Video game worlds are also part of the imaginary world tradition, which reaches back at least three millennia, to the first imaginary worlds found in literature (Wolf, 2012). Specifically, video games are an extension of the subcategory of interactive imaginary worlds, the history of which can be traced back to such things ranging from dollhouses and model railroading to table-top war games, and which extends through the twentieth century including building sets, playsets, and table-top role-playing games such as *Braunstein* (David Wesley, 1967) and *Dungeons & Dragons* (TSR, 1974). Text adventure games began as computerized versions of role-playing games, with the computer taking on the role of the "Dungeon Master" who controlled the game. Graphical adventure games began soon after, replacing verbal descriptions with images, and borrowing conventions from other visual media in which worlds had been depicted, including film and comic books.

Besides sharing many things with imaginary worlds of the past, video games also bring new innovations to the imaginary world tradition, since they are also *virtual* worlds. Virtual worlds are collections of world data like the worlds of novels and films, but the way that those data are automated and manipulated to construct an experience is something new to the imaginary world tradition (though some science fiction authors wrote about the possibility of virtual worlds before any actually existed). Unlike the imaginary worlds of novels, film, television, and other non-interactive media, virtual worlds enjoy a different ontological status. Instead of existing as a set of recorded words, images, and sounds, video games exist in the present tense, as mathematical models within a computer's memory, ready to be incarnated as interactive imagery.

The player's control of the main character in a video game can also be seen as an extension of the main character's role in the imaginary world tradition. Often in traditional narratives involving imaginary worlds, the main character, or protagonist, is a traveler to a new world, through whom the audience experiences the world vicariously. While in earlier worlds the protagonist tended to be a traveler and observer, as time went on, and especially into the twentieth century, main characters became more actively involved in the imaginary worlds they visited, even becoming agents of change in those worlds. Video game worlds can be seen as extending that interactivity to the audience members, and thus, can be seen as another advancement of the imaginary world tradition begun thousands of years ago.

Thus the video game's role within the imaginary world tradition has impacted that tradition as well, as video games join the long line of other media windows offering us glimpses of imaginary worlds, and in some cases, letting us reach through those windows and become active participants in them. In addition to presenting new types of imaginary worlds such as the social, shared virtual worlds of MMORPGs (or non-game worlds such as *Second Life* (Linden Labs, 2003)), game designers are also finding new ways for games to fit into transmedial worlds, where they can range from being merely a playground themed with interpretations of the imagery and iconography of a world, to a central, canonical part of the backbone of a world.

Video Games and Their Role in Transmedial Worlds

Transmedial imaginary worlds must adapt themselves to each medium they appear in, and likewise, the nature of a world may change along with the type of media in which it appears. Video games may be an extension of an imaginary world that originated in another medium, or an imaginary world originating in a video game may spread to other media. Either way, the combination of media, and particularly interactive and non-interactive media, can raise questions regarding the onotological status of a world and the canonicity of events in that world (which is to say, the events that "officially" happen in that world).

Worlds are defined by the objects and events that compose them, and these in turn are defined by what is considered canonical for a given world. Video game worlds clearly have canonical objects and characters, but due to their interactive nature, can they be said to have canonical events? In virtual worlds such as those of MMORPGs, which are usually not restarted or reset, one could argue that all events are canonical, since they occur diegetically within the world in question. Or one could argue that by a stricter, narrower definition, such worlds do not have canonical events apart from those "official" ones produced by the author of the world, such as those found in "expansions" and large-scale events that affect an entire world.

Canonicity can depend on the level of interactivity present. A non-interactive world almost always has a set of *specific* canonical events, which defines the world and the audience's experience of it: in Middle-earth, Frodo always takes the Ring to Mordor; in the *Star Wars* galaxy, Luke always becomes a Jedi; in the world of *The Matrix*, Neo always defeats Agent Smith, and so on; these events are fixed parts of their worlds' histories. An interactive world can have specific canonical events as well; for example, in video games, the events taking place during cut-scenes that are the same every time and not altered by gameplay. Likewise, an interactive world can also have what we could think of as *general* canonical events: Inky, Pinky, Blinky, and Clyde always chase Pac-Man; the Qotile always shoots swirls of energy at enemy Yars; and the Space Invaders always advance downward and eventually crush the player's avatar. While the specific details of these events vary with each game, they are still inevitable and always a part of the world. General canonical events often involve the main conflicts of interactive worlds, and thus are a constitutive part of the audience's experience of the world.

Interactive worlds with alternate storylines can also treat some endings as canonical and others as non-canonical. For example, in *Riven* (Cyan, 1997), out of ten possible endings, only the ending in which the player frees Catherine, allowing her to rejoin Atrus before Riven is destroyed, is canonical, since Catherine appears later in *Myst III: Exile* (Presto Studios, 2001). In such games, the player's challenge is to see to it that canonical events play out as they should; all interactivity amounts to merely exploring a world and keeping events going the way the author has predestined them to go. By keeping to a set storyline, however, such games can be more fully joined to their non-interactive counterparts in a world's history; thus the events of *Riven* can occupy a central place in the franchise's overarching story.

In contrast, interactive branches of a transmedial world may only play with characters, locations, and situations, without adding any new events to a world's canon. The *LEGO Star Wars* video games (Traveller's Tales, 2005–2010), for example, feature LEGO versions of the franchise's characters and locations, and the game's cut-scenes are parodic versions of scenes from the films. The players' avatars engage in activities seen in the films, such as lightsaber fights and the piloting of vehicles and spaceships, but often in very different contexts and locations that mimic but do not reproduce those in the films; the games are essentially three-dimensional platform games dressed up in *Star Wars* attire. In these kinds of games, canonical events from other media incarnations of a world are alluded to or even replayed, but no new canonical material is added to the world. Interactive branches of a transmedial world, then, vary greatly in their relationships with their non-interactive counterparts, yet in all cases they provide the audience a new experience related to the world, and one that potentially can strengthen the audience's engagement and involvement with a world.

A Very Brief History of Video Game World Development

While works set in other media could build more complex worlds, due to the use of literary description (in the case of books), photography and video (in film and television), or hand-drawn imagery (in comics and animation), the limitations of early computer graphics kept the worlds of video games simple and relatively abstract at their beginning, and sometimes also reliant on text.

The earliest games often had a single screen of graphics depicting their worlds visually, or text descriptions describing them verbally, or some combination of text and graphics. World information required memory, and in the early 1970s, only mainframe computers were able to accommodate games with more developed worlds, including text adventure games such as *Adventure* (Will Crowther and Don Woods, 1976) or the first two games with three-dimensional graphics, *Maze War* (Steve Colley, 1974) and *Spasim* (Jim Bowery, 1974), short for “space simulator.” When video games became a commercial industry, arcade video games had to be simple and based on fast action (in order to bring in more quarters per hour), which worked against more complex games with more elaborate worlds. In the end, only a few arcade video games would have relatively detailed worlds; some were original, such as those of *Gravitar* (Atari, 1982) and *Major Havoc* (Atari, 1983), while some were extensions of worlds seen in other media (such as *Star Wars* (Atari, 1983) or imitations of them (*Stellar Track* (Atari, 1981) was loosely based on *Star Trek*, just different enough to keep from infringing copyright). Additionally, arcade games had to be fairly intuitive in their design to be immediately usable, whereas home video games could be described and explained in a manual, allowing them to be more complex (for example, *Space Shuttle* (Activision, 1983) for the Atari VCS 2600 had a 32-page game manual that described and explained all the features of the controls and the actions the player could (and had to) accomplish).

Home video games, which were purchased by the consumer and expected to provide long hours of gameplay, could better accommodate games with a slower pace that were oriented more for puzzle-solving and exploration than for fast action. The adventure game genre flourished on home systems, and perhaps more than any other genre, it placed an importance on a game’s world, its exploration, and the illusion of an open-ended adventure in which the player character could move about freely and encounter a world’s locations and inhabitants. Games such as *Zork* (Infocom, 1979), *Adventure* (Atari, 1979), and *Ultima* (Origin Systems, 1980) had large game worlds that were experienced respectively through text descriptions, graphics with screen-to-screen cutting, or graphics with four-directional scrolling, and all three encouraged the production of sequels and imitators.

As the amount of available computer memory grew, so did the size and complexity of video game worlds. Online worlds, such as those of *Scepter of Goth* (Alan E. Klietz, 1983) allowed multiple players to pay simultaneously within the same text-based world, while other online worlds such as *Islands of Kesmai* (Kesmai, 1985) and *Habitat* (Lucasfilm, 1986) had graphical worlds in which online players’ avatars could gather. The use of disks and diskettes increased storage capacity, and later CD-ROMs greatly increased the amount of storage to hundreds of megabytes, allowing for larger and more detailed worlds, such as *The Manhole* (Cyan, 1987) and *Myst* (Cyan, 1993), as well as games requiring multiple CD-ROMs to hold their worlds (such as *Riven*). While Cyan’s games were series of pre-rendered images linked together into a navigable three-dimensional world, other games of the time, such as *DOOM* (id Software, 1993), *Descent* (Parallax Software, 1995), and *Tomb Raider* (Eidos, 1996) had three-dimensional worlds that players moved in with a real-time rendered first-person perspective that increased the feeling of immersion in the world. More detailed worlds meant more complicated storylines (whether pre-determined, embedded, or emergent), and more involvement and engagement of players, who could spend hours at a time vicariously inhabiting a world (such as those of the games of the *Halo, Grand Theft Auto*, and *Elder Scrolls* series of games).

The latter half of the 1990s also saw the rise in popularity of MMORPGs starting with *Meridian 59* (Archetype Interactive, 1995). Like the worlds of earlier networked and online games, players could play against other human-controlled players rather than merely algorithm-driven NPCs (although game AI did improve them considerably). The size and scope of MMORPGs, as well as their continuous and ongoing existence, quantitatively and qualitatively changed the nature of the game worlds, leading to video game worlds more like the actual world, with guilds, groups, and communities arising and long-term narratives playing out as players developed their own properties, cooperating and competing with others, and developing world infrastructures. Such worlds have become the subject of much scholarship and even experimentation in the social sciences. Discussing the study of common-resource pool problems and macrolevel behavioral trends using virtual worlds, telecommunications researcher Edward Castronova and his team write:

> By their nature, synthetic worlds are ideal tools for this research method. In order to allow for vast, persistent worlds, the servers on which such environments are stored must keep track of an innumerable amount of data. Among many other variables this includes player ability statistics and assets, auction inventory and market prices, resource depletion, and the randomized appearances of rare goods. Additionally, besides tracking information on the state of the world and players, databases may also be used to monitor nearly all of the social interactive content of the synthetic world. This includes components such as chat logs and player emotes (commands for the visual display of emotive avatar animations). All of this information can be stored, and later, mined for aggregate trends in player behavior.…
>
> In addition to tracking and storing vast amounts of behavioral data, synthetic worlds also permit the experimenter a great deal of control. All manner of methods by which players interact with the environment and each other (including exchange rates, rates of resource renewal, communication channels, and market locations) may be manipulated, allowing for a wide range of potential experimental variables. In controlling for world conditions, experimenters may then observe the dependent effect on participant behavior. We argue that these observations are significant because of the inherent complexity of the social environments in which they occur.
>
> (Castronova et al., 2008, pp. 284–285)

The ongoing existence of these worlds, as well as the necessity of choosing what is seen or experienced from a myriad of simultaneous events, creates an experience quite unlike that of the worlds experienced through traditional media such as books, films, and television shows, and even other video games. Events are unrepeatable, and most will go unseen by any particular player, yet players can remain online several hours every day without exhausting all the world has to offer.

Finally, there are video game worlds that are overlaid over the actual world, using augmented reality technology, which may include mobile computing technology, global positioning satellite tracking systems, cameras, projectors, and other recognition technology. These games map their game worlds onto actual physical spaces, so that players must move around physically while the game tracks the player’s location and reacts automatically in real time, mapping virtual spaces onto physical spaces and visualizing the results. Augmented reality games for mobile gaming devices (such as an iPhone, iPod, or iPad), include *Ghostwire* (A Different Game, 2008) and *Sky Siege* (Simbiotic, 2009), which position game elements virtually in the space around the player, who must turn around and use the mobile device as a window to see what is occurring in the game. Another game, *Pandemica* (XMG, 2009) allows four players to play together, shooting at virtual aliens positioned around them. Ogmento, a company started in 2009, is devoted exclusively to the production of augmented reality games.

Conclusion

A video game's world can be easy to overlook as it provides the background to the game's action and events, which are often the focus of both players and critics, along with characters and their capabilities. But video games worlds are vicariously inhabited by players, and this alone is reason enough to consider them. Video game worlds can link games to transmedial franchises or even the actual world, providing models of immersive spaces that designers can use in other areas such as web design, educational media, informational media, and scientific visualizations and experiments. As virtual worlds incarnating the dream of imaginary worlds that can be entered and experienced by an audience, video game worlds have advanced the imaginary world tradition, and have a potential limited only by computing power and human imagination.

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Part III

PLAYFULNESS ASPECTS

17

CASUALNESS

Julia G. Raz

Whether in your living room, your friend's house, on your cell phone, at a bar, at an office party, in a retirement home, or on a cruise ship, it is likely you have come into contact with games such as *Wii Sports* (Nintendo EAD, 2006), *Rock Band* (Harmonix Music Systems, 2007), *Guitar Hero* (Harmonix Music Systems, 2005), *Dance Central* (Harmonix Music Systems, 2010), *Angry Birds* (Rovio Entertainment, 2009), or *Farm-Ville* (Zynga, 2009). These games are referred to as casual games, that is, games that do not require a long-time commitment, use complex buttons on a controller, or even require an underlying understanding of how to play a video game.

"Casualness" signals a number of ways we might understand how we play and who plays; how the industry has evolved and reconfigured; how games have become prominent socials arenas, and how the effects of gaming on our health and well-being are investigated by social scientists. The meaning of "casualness," or "casual," is twofold, referring to a particular genre of video game as well as a method of gameplay. "Casual games" is a term coined and used by the video game industry and game players, often defined in opposition to "hardcore" games. In *A Casual Revolution: Reinventing Video Games and Their Players*, Jesper Juul (2010) traces the history of casual video games, and argues that new, casual video games are broadening the spectrum of game players as video games gain widespread acceptance. Juul explains:

> [T]his was not about video games becoming cool, but about video games becoming normal. Normal because these new games were not asking players to readjust their busy schedules. Normal because one did not have to spend hours to get anywhere in a game. Normal because the games fit the social contexts in which people were already spending their time, normal because these new games could fulfill the role of a board game, or any party game.
>
> (2010, p. 1)

This essay explores the topic of "casualness" through historical, industrial, media effects, and ethnographic perspectives. Game studies are a recent area of inquiry when compared to the decades of work in media studies, which investigate media texts in film, radio, and television. The academic examination of the casual game/gaming phenomenon is a relatively new and emergent subfield in the discipline of game studies. Though not exhaustive, this essay reviews the academic literature on casual video game studies, primary scholars, and theories within the casual video game studies realm, and argues that the discourse surrounding casualness offers productive starting points for understanding how the gaming industry, the identity and sociality of players, and the spaces of play have transformed in the past three decades.

In the past, we saw kids in arcades playing short, fast games for a quarter and socializing with their friends. One might also expect to find people playing video games alone at home (often with the false, archaic stereotype of the teenage, male gamer), and playing only for extensive time periods; however, this is no longer the case. The Electronic Software Association's (ESA) "2012 Essential Facts about the Computer and Video Game Industry" reveals what has been evident to game scholars and those in the industry, but still remains unknown to much of the general public: the average game player is now 30 years old, 47 percent of all gamers are female, and the video game that had the second most sales per unit in 2012 was a casual game, *Just Dance 3* (Ubisoft Paris, 2011). The ESA (2012) also found that gamers tend to spend more than half of their gaming time playing with others: "Sixty-two percent of gamers play games with others, either inperson or online. Seventy-eight percent of these gamers play with others at least one hour per week. Thirty-three percent of gamers play social games" (2012, "Industry Facts" section). As evidenced in my personal conversations with industry professionals from companies that produce video games categorized as casual, such as Harmonix Music Systems and Nintendo, these games are marketed to and played by a broad audience; that is, players of all ages, men and women. But let's not forget that the average gamer was not always 30, and that his or her kids are also playing games. Furthermore, the increase in casual games correlates with an increase in the number of women video game players (ESA, 2012).

Casual Games

"The secret is out: everyone loves casual games. No matter age, gender or nationality, casual games are finding their way to the most ubiquitous platforms from the PC to iPhone to Facebook" (Casual Games Association, 2012a, "About" section). This is how the Casual Games Association, dedicated solely to the casual game industry (with the specific focus on games produced for the mobile phone and Internet browser platforms) publicized its lucrative activities. Indeed, these types of games have a large and diverse audience, reaching over 200 million people each month (Casual Game Association, 2012b, "FAQ" section).

In order to understand the prevalence and success of casual games, it is necessary to unpack the various types of casual games, the platforms they are produced for, their components, and the types of experiences they facilitate. According to Juul, there are two, overarching trends of casual games: mimetic interface games, such as *Wii Sports*, and downloadable games, such as *Bejewelled* (PopCap Games, 2001), which do not require the player to mimic the on screen action (2010, p. 5, p. 103).

Juul (2010) discusses the physical player space that is emphasized by casual, mimetic interface games. The term "mimetic" is used to define the type of games that require the player to mimic the actions being displayed on the screen (Juul, 2010, p. 5). He claims:

> Where traditional hardcore games focus on creating worlds, on 3-D space, and downloadable casual games focus on the experience of manipulating tangible objects on screen space, mimetic interface games emphasize the events in player space. Mimetic interface games encourage us to imagine that the game guitar is an actual guitar that we play on, and the Wii controller is an actual tennis racquet we swing to hit the ball.
>
> (Juul, 2010, pp. 103–107)

It is the physical player space that significantly constitutes play of console-based casual games such as *Rock Band*, *Guitar Hero*, and *Wii Sports*, as you might find at office parties or gatherings in your home (Juul, 2010, p. 114).

Similarly, others emphasize the centrality of casual game play as shared, social experiences that often occur in the living room. In *Codename Revolution: The Nintendo Wii Platform* (2012), Steven E. Jones and George K. Thiruvathukal combine their textual studies and computer science backgrounds in their book, which solely focuses on the Nintendo Wii platform. To Jones and Thiruvathukal:

> It's [the Wii is] designed around the notion that gameplay ideally happens in a shared space where social interactions, at least potential ones, are at the heart of the experience. Rather than being designed to maximize the immersive graphics of the virtual battlefield, kingdom, dungeon, or city in which the game takes place, the Wii's somatic and mimetic network of controller objects were expressly made with the physical living room in mind.
>
> (2012, p. 19)

In order to understand the prevalence of casual games, it is also important to distinguish between the platforms for which casual games are produced. Casual games are produced for traditional home consoles, as well as mobile phone and Internet browser platforms. You might imagine a time when you or a neighbor played *Angry Birds* for five minutes while waiting for class to start, or checking the progress of the crops on your farm in *FarmVille* while catching up with a friend on Facebook chat. The short, fast-paced, downloadable game *Angry Birds* requires the player to use the smart phone touchscreen to employ its simple controls. Although some downloadable games and console games have similar mimetic interfaces, in *Angry Birds*, players use a touchscreen, rather than a controller, in order to manage the slingshot that sends birds towards the pigs. Similarly, *FarmVille* is casual and non-mimetic, as it does not require a substantial time commitment and has simple controls, although unlike mimetic games, the player clicks the computer mouse in order to accomplish in-game tasks, such as fertilizing crops, buying supplies, and giving gifts, rather than mimicking the on-screen action. Indeed, many casual games, both mimetic and downloadable, are considered social games, as they facilitate simultaneous game play among multiple players. For example, the casual video game *Rock Band* is a social game because there can be a number of people playing different instruments in the band in the same room. A number of players in one room can form their own "band," playing drums, bass, guitar, or singing on the microphone. Social network games, such as *FarmVille* or *Mafia Wars* (Zynga, 2009) on Facebook, also have widespread popularity and offer a means for increased sociality among gamers as well as people who would not otherwise play video games. In *FarmVille*, for example, players can share gifts with fellow "farmers" and better their farm by befriending more players. Rather than competing against each other, this game requires co-operation and altruism in order to level up.

Another important component of casual video games is that they are usually nonviolent. For instance, in *Wii Sports*, you can play tennis, basketball, and bowling matches with "cute" characters, or Miis. This is distinct from games categorized as "hardcore," such as *Gears of War* (Epic Games, 2006) or *Call of Duty* (Infinity Ward, 2003), where players engage in violent military battles. The nonviolent component of casual games is often utilized as a marketing strategy for companies producing these games, as advertisements and commercials depict casual games as entertainment suitable for the whole family. For example, in early Nintendo Wii commercials, the nuclear family of Mom, Dad, and two children was depicted as enjoying playing *Wii Sports* together. Whereas there has been consistent concern in media effects research for the potential detriment of violent gameplay on producing violent behavior, casual video games offer something different—marketed as "safe," family-friendly entertainment products.

Casual games are often situated, as it was said earlier, in contrast to "hardcore" games, or "core" games, by those in the industry as well as by video game players. It is not universally accepted that these terms should be put in opposition; however, it provides a convenient way of defining what casual games and game play is and is not. According a design lead at Harmonix Music Systems, the makers of *Dance Central* and *Rock Band*:

> I'm not a fan of the terms "casual" and "hardcore" although I am the first to admit that I am one to throw them around from time to time. Our [Harmonix's] games serve a wide variety of gamer types. Some players buy the games just to play on the weekends with friends while others are "hardcore" in every sense of the word … They buy our steady stream of DLC [downloadable content], post videos of themselves performing routines online, produce a steady stream of Deviantart and digitally insert themselves into our gameworld. Our players make the same kinds of the deep personal connections you see in "hardcore" titles.
>
> (Harmonix design lead, personal communication, July 2, 2012)

His response speaks to the ubiquity of these terms in industry rhetoric, though he simultaneously argues that the terms may not be the most useful way of defining what a game is or how to make sense of game play experience. For him, rather than focus on these two terms as binaries, it is more important to focus on the "deep personal connection" people have when they play a game.

The Casual Games Association (2012b) offers a useful analogy, relating casual and hardcore games to particular movies. They claim that "core" games are created for "core" players, who expect high-end graphics and technology, and elaborate plot lines, whereas casual games are created solely for fun, quick, and easily accessible play:

> Think of Atari and games such as *Pacman* [*sic*] [Namco, 1980], *Space Invaders* [Taito Corporation, 1978], *Frogger* [Konami, 1981], and *Donkey Kong* [Nintendo, 1981]. Casual games have maintained the fun, simplicity, boundless creativity that characterizes arcade-style games. On the other hand, enthusiast games also termed "[hard] core", such as *Grand Theft Auto* [DMA Design, Tarantula Studios, Visual Sciences, 1997], *DOOM* [id Software, 1993], and *Mortal Kombat* [Midway Games, 1992], have been developed using high-end technology that appeals more to younger audiences. Using movies as an analogy, casual games would be *Friends* [David Crane and Marta Kauffman, 1994–2004] or *ER* [Michael Crichton, 1994–2009], and enthusiast games would be *Reservoir Dogs* [Quentin Tarantino, 1992] or *Silence of the Lambs* [Jonathan Demme, 1991].
>
> (Casual Games Association, 2012b)

This analogy demonstrates the way the industry often simplifies and dichotomizes these two genres of games. The industry sees casual games as analogous to TV and hardcore games analogous to movies, revealing the industry's many ideological assumptions about popular entertainment and serious drama. Further, the problem with this dichotomy is it fails to acknowledge the overlaps in gameplay style and players of casual games. Do casual games, such as *Rock Band* and *Just Dance*, only facilitate casual play, or can casual games be played hardcore?

Casual Gameplay

I currently define myself as casual player of casual games, though am the first to admit that I have played games that are typically characterized as casual games in a "hardcore" way. I recall spending six hours playing *Guitar Hero 2* (Harmonix Music Systems, 2006) the day I purchased the game, intent on beating as many songs as possible on the hardest difficulty, "expert." Eventually my hands became sore and the notes started blurring on the screen—what one would expect of any long gameplay session.

This is one of the distinctions of casual games from games deemed hardcore. Whereas hardcore game access is limited to new gamers and requires a significant time commitment to acquire the skills needed to progress through a game, casual games can be played casually or hardcore. As Juul states:

> This explains the seeming paradox of the casual players making non-casual time commitments: a casual game is sufficiently flexible to be played with a hardcore time commitment, but a hardcore game is too inflexible to be played with a casual time commitment.
>
> (2010, p. 10)

For example, at a bar holding Rock Band nights, a player may decide to perform (play) only one song in front of the crowd. Though only one song was played, the completion of one song signals the end of the player's turn, and does not necessitate more time dedication to gameplay; this becomes particularly evident when a "no fail" mode can be turned on, as any player can complete an entire song no matter how well they play. However, full "bands" of Rock Band players competing in a national competition have to be committed, spending countless hours preparing for competitions, and documenting their efforts on YouTube (Miller, 2012, p. 4).

Research Trends Regarding Casual Gaming

The research on casual games and casualness remains a new and developing area within game studies. As you will have noticed throughout this essay, the research drawn up only goes back to 2009. Juul's *A Casual Revolution: Reinventing Video Games and Their Players* (2010) remains a seminal overview for those studying casual games, as it traces the rise of casual games and gaming, as he terms, the "casual revolution," from historical and industrial perspectives (2010, p. 2). Likewise, Jones and Thiruvathukal's *Codename Revolution: The Nintendo Wii Platform* provides an insightful companion to Juul's book, as it specifically explores the Wii console as the "revolutionary" factor in the "casual revolution"—from historical, industrial, technical, and textual analytic vantage points (2012, pp. 2–3).

Much research on casual games addresses the health potential of casual games/gameplay, such as on the benefits of playing movement-based, mimetic games for elderly people's mobility. Coming from a social scientific perspective, these studies frequently use survey and experimental methodologies to research the effects of casual video gameplay on people's health. Studies have also investigated other health benefits of playing movement-based, casual games on people's weight, mood, and well-being. Overall, these studies provide mixed findings as to the efficacy of this type of game/gameplay on people's health. In what follows, I provide key exemplars of research that focus on casual games and health in the media effects tradition, in order to show that there is yet to be a consensus regarding the health benefits of these games.

Two studies find casual video games to be a significant contributor to health improvement among game players. In "The Effectiveness of Casual Video Games in Improving Mood and Decreasing Stress" by Carmen V. Russoniello, Kevin O'Brien, and Jennifer M. Parks (2009), casual video games were utilized in an experiment measuring the effectiveness of these games for reducing stress levels and heart rate. In the study, they selected three casual video games to test whether players would demonstrate reduced stress levels: *Bejeweled 2* (PopCap Games, 2009), *Bookworm Adventures* (PopCap Games, 2006), and *Peggle* (PopCap Games, 2007). Similarly, another study found positive results in regard to casual video game play's effectiveness on acute cognitive benefits, specifically concentration, focus, and affective states (Gao & Mandryk, 2012, "Discussion" section, paragraph 4). Solely focusing on what they term "exergames," such as those created for the Kinect for Xbox 360 (Microsoft, 2010), in "The Acute Cognitive Benefits of Casual Exergame Play," Yue Gao and Regan L. Mandryk (2012) found significant improvements in participants' cognitive functions as well affective states from playing ten minutes of an "exergame" over a sedentary casual game.

Does this mean people should play casual video games if they want to improve their health? An alternate study in 2012 the *Journal of the American Academy of Pediatrics* would argue, no, if you are hoping for your child to become more physically active. Also taking a social scientific approach to the study of video games, Tom Baranowski et al.'s "Impact of an Active Video Game on Healthy Children's Physical Activity" (2012) found no significant results in healthy children's activity levels upon playing an active, casual video game on the Wii console versus playing an inactive, casual video game in safe versus unsafe neighborhoods (p. e636). In this 13-week experiment, participants were monitored by accelerometers in order to assess changes in physical activity. According to their study: "These results provide no reason to believe that simply acquiring an active video game under naturalistic circumstances provides a public health benefit to children" (Baranowski et al., 2012, p. e636). Unlike the two aforementioned studies that found significant health benefits from playing casual video games, this study found no significant results, maintaining that children will not become more active when an active video game is introduced, independent of neighborhood safety.

Concurrently, other studies have examined the impact of "exergames" on physical activity do find these games to have a positive impact on children's activity level after gameplay. For example, Perron et al.'s "Do Exergames Allow Children to Achieve Physical Activity Intensity Commensurate with National Guidelines?" (2011) found children playing *EA Sports Active* (EA Canada, 2009) "elicited a higher exercise intensity" than *Wii Fit*, and that both games achieved a sufficient intensity for the national guidelines for children's exercise (pp. 231–232). Overall, these studies demonstrate the mixed results of the impact of casual video game play on people's health.

Music games within the casual game realm is also an area researched by game scholars, though this research tends to be conducted through ethnographic, ethnomusicological, and historical research. Much of the research on music games focuses on player authenticity, musicality, and performativity. For example, ethnomusicologist Kiri Miller explores in *Playing Along: Digital Games, YouTube, and Virtual Performance* (2012), the value of music games, such as *Rock Band* and *Guitar Hero*, as well as the game, *Grand Theft Auto*, in allowing performativity, engagement with rock music, and musicality (pp. 5–8). Specifically, Miller analyzes experiences of *Rock Band* and *Guitar Hero* play on YouTube and in public spaces. She coined the phrase, "schizophonic performance," arguing that the greatest value of *Guitar Hero* and *Rock Band* game play is that players are engaged through performance with the musical piece (p. 15). Miller claims, "*Guitar Hero* and *Rock Band* let players put the performance back into recorded music, reanimating it with their physical engagement and adrenaline. Players become live performers of prerecorded songs, a phenomenon that I refer to as schizophonic performance" (p. 15).

Miller also documents this type of gameplay in public spaces, such as at bar nights and tournaments (2012, p. 125). She argues that though playing *Rock Band* and *Guitar Hero* are not like playing a real guitar, performing the popular, rock songs, whether in a group or by yourself, offers a unique, meaningful experience:

> Playing *Rock Band* and *Guitar Hero* isn't just like playing a real instrument, but it's nothing at all like listening to music. The affective experience of making music is bound up with embodied performance, and these games compel bodily engagement.
>
> (2012, p. 150)

Similar to studies discussed earlier that find positive, affective, health benefits from playing casual games, Miller's ethnomusicological work finds that people experience positive affect when playing *Guitar Hero* and *Rock Band* (p. 150).

Conclusion

This essay has focused on "casualness" as a term that refers to a genre of video games and a way of playing games. Though the terms "casual" and "hardcore" are commonly used in opposition by the industry and players, it may not be useful to dichotomize these terms. As explained earlier, casual games can be played "hardcore" or "casually," though "hardcore" games do not allow for "casualness." What is the efficacy of casual games on people's health and well-being? This question remains to be fully answered. Casual games allow for increased sociability, a broader range of players, and shifts in gameplay spaces. In sum, this essay has argued that unpacking the discourse surrounding casualness provide avenues for understanding the evolution of the industry and the ways and spaces in which people engage with gameplay.

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18

CHALLENGE

Robert Furze

Examples of Video Game Challenge

Consider the following two contemporary examples of gameplay in video games.

> Niko Bellic is standing on a highway off-ramp overlooking a low-rise building. He has spent hours in Liberty City—a fictional urban environment modelled on New York—participating in the many discretionary activities it has to offer, including this one: finding and killing the two hundred pigeons that are hidden throughout the city. Scanning the roof, Niko sees the pigeon, head bobbing in the shadows of a billboard supported by the low-rise's roof. Niko aims his gun, destroys the pigeon in a flurry of feathers. A moment passes, then a message flashes on the screen: "All diseased pigeons killed. LC is a cleaner place."

> The elevator door opens and Chell steps into Test Chamber 08. The layout is familiar—an austere, white chamber—and Chell's objective, too, is obvious: to reach the sign-posted exit on the other side. Impeding her progress is a pool of noxious liquid that extends the width of the room. Chell knows she will not be able to jump over it. There are other objects in this chamber: a clear platform; a machine that intermittently spits out lethal energy pellets; and a pressure pad that presumably, once activated, will trigger a mechanism somewhere in the room to aid her progress. As with the exit itself, all these items cannot be accessed directly. However, to help her reach the other side, Chell is armed with a portal gun; a device that, when fired at a surface, creates a shimmering blue ovoid doorway. This "portal" allows physical objects—and Chell herself—to access unreachable places in the environment via a corresponding orange portal that is positioned elsewhere in the chamber. Chell sees this orange portal now, just above the clear platform and—with the aim of stepping onto the platform—uses the portal gun to open a blue portal in the wall beside her. This is a mistake, as one of the lethal energy pellets, that is directed at the orange portal, passes through it and continues its trajectory through the blue portal beside Chell. The pellet hits Chell, thereby ending her attempt at completing this chamber's objective. As the game reloads and Test Chamber 08 is reset, Chell will have to use her reasoning, and experiment in the physics-bending capabilities of the portal gun, in order to reach the exit.

Each of these examples—from, respectively, the open world gangster game *Grand Theft Auto IV* (also known as *GTA4*; Rockstar Games, 2008) and the puzzle game *Portal* (Valve, 2007)—demonstrate the diverse methods by which a player might engage with a video game's world. Niko Bellic's hunt for the pigeon and Chell's efforts to navigate a trapped room to the exit vary in certain crucial ways, but both indicate the importance that challenge contributes to the dynamic structure of video games. Challenge is found in the eventual discovery of a pigeon and the reward it garners; and in the misplacement of a portal that leads to the protagonist's death: probabilities of success and of failure epitomize the essence of challenge in the video game.

Challenge, however, is present outside—and exists prior to—the player's pursuit of success and failure within a virtual world. Challenge is part of life, work, and relationships. Indeed, outside the structures of gameplay itself, there are challenges related to the wider video game culture that are comparable to those in other cultural arenas. So, when Bernard Perron and Mark J. P. Wolf (2008) note the challenges facing the game critic and theorist who struggles to find "copies of old games and the systems needed to play them" (p. 6), it becomes a problem broadly familiar to academics, archivists, and collectors of film, music or literature.

The Appeal of Video Game Challenge

There is nonetheless a clear distinction to be made between such real-world challenges and those offered up by the virtual worlds of *GTA4* and *Portal*. Success and failure are part of life, but when playing a video game, a person becomes a willing participant; both prepared to be tested by the game and adhere to its rules. This is the conclusion reached by philosopher Bernard Suits in his analysis of why people play games. He writes: "Playing a game is the voluntary attempt to overcome unnecessary obstacles" (2005, p. 157).

Originally writing in 1978, Suits's definition of games as *voluntary* challenges was conceived as a means of understanding such "playful" activities from games of cops and robbers to golf. Suits conceives of a "lusory attitude"—the player's acceptance of the boundaries within which gameplay is possible—to explain the seemingly arbitrary arrangement of restrictions put upon the player to achieve a goal (p. 16). In golf, the player understands that for the objective to be met—dropping a ball into a hole—there must be impediments: the large size of the terrain, hazards such as water and sand, the use of specific equipment (clubs) and so on. Without such voluntary obstacles, the player could simply pick up the ball and drop it into the hole. Applied to video games, the voluntary challenge is built around the player's willingness to navigate an environment specifically constructed as an obstacle to success (an urban sprawl that hides pigeons for the player to discover; a room in which the player must figure out how to reach the exit) and designed to impede the player's progress. But challenge is also evident in the player's recognition that video games involve learning and mastering certain methods of input—such as controllers or keyboards—whose designs and systems of button or key presses are, at first glance, as arbitrarily constructed as the putters, irons and woods used in a game of golf. As Suits has it, "the rules prohibit more efficient in favor of less efficient means … such rules are accepted just because they make possible such activity" (2005, p. 75).

Suits's generalizing claim that games are essentially challenge-focused was highlighted in the 2003 publication of Katie Salen and Eric Zimmerman's *Rules of Play* (2003). This book was written—as was Suits's—with a mind to define games in general; but with its capacity to broaden its analyses to include video games and discuss thinkers who were hitherto unexplored into their pages, Salen and Zimmerman’s primer introduced alternative methods of understanding what video games are. Challenge is not the only way in which *Rules of Play* distinguishes games, of course, but Suits’s definition is integral to understanding the appeal and structures of video games; it leads the authors to conclude that challenge—after Suits’s description of overcoming “unnecessary obstacles”—is a combination of conflict and rules. On conflict they write: “All games embody a contest of powers. The contest can take many forms, from cooperation to competition, from solo conflict with a game system to multiplayer social conflict. Conflict is central to games.” And on rules: “Rules provide the structure out of which play emerges, by delimiting what the player can and cannot do” (2003, p. 80).

The need to more seriously consider the role of challenge in video games was timely, as many more theories until the publication of *Rules of Play* identified games as competitive activities. Looking to establish a theoretical language of its own, video game studies of this time found it in another classic text, Roger Caillois’s *Man, Play, and Games* (originally published as *Les Jeux et les Hommes* in 1958). Caillois’s comprehensive taxonomy of games was highly influential, and so was one of his categories—*agôn*, meaning competition. However, in appropriating Caillois’s *agôn* to video games, the term stood to represent not only competition but also challenge, since challenge did not have its own category. Hence, in an essay by Markku Eskelinen and Ragnhild Tronstad *agôn* is described as the process of “winning through struggling” (2003, p. 214); and for Peter Vorderer, Tilo Hartmann and Christoph Klimmt—discussing id Software’s game, *Quake* (1996)—the introduction of “a horde of evil monsters” that try to kill the player adds a “competitive element” to the gameplay (2003, p. 2). Sometimes this conflation of competition and challenge is part of the language through which game manufacturers describe the games themselves. The manual for Kee Games’ *Tank!* (1974) distinguishes its two-player military simulator from other games on the market by evoking competition in such a way: “Historically, video games have employed non-violent competition between players (e.g. all paddle and driving games) or violent competition between a player and the machine (e.g. *Computer Space* [Nutting Associates, 1971]).”

In each of these cases, competition defines terms that Salen and Zimmerman, after Suits, identify as closer to what would be more clearly understood as challenge: struggle and the overcoming of obstacles (for example *Quake*’s evil monsters). Video game terminology needed to evolve so that challenge became distinct from competition, and did not become subsumed by it. The description from the *Tank!* manual offers a useful delineation here: between competition as a social activity and the essentially solo endeavor of a player attempting to overcome obstacles within the framework of the game’s rules—in other words, challenge. While there are comparisons to be made between competition and challenge, the growing popularity of online multiplayer games—such as the massively multiplayer online role-playing game (MMORPG), *World of Warcraft* (Blizzard Entertainment, 2004) and the *Call of Duty* franchise (Activision, 2003 onwards)—reveals there are differences, just as they suggest the importance of investigating how far those differences extend. For Salen and Zimmerman, competition contains an element of challenge, just as for followers of Caillois, challenge could be read as synonymous with competition. To be clear, however, it is not simply the case that challenge was not discussed at all by video game theorists prior to *Rules of Play*—there are examples here of writers who were doing precisely that—but that after 2003 the distinctions between challenge and competition became far clearer.

Challenge, then, involves the player's willing engagement with a system of obstacles and rules; but what compels some players to pursue every last pigeon in Liberty City or reason out the way to an exit in one of *Portal*'s test chambers, doggedly pursuing success incrementally, or failure consistently? The repetition of actions in games shows that the designs and systems formulated specifically to challenge the player are also, when successfully implemented, able to entice the player to return more readily to those challenges. So, it is true that, in general terms, success and failure are seen to characterize challenge but in encountering obstacles unique to gameplay, the player's motivation to complete a game's challenges is, as Suits states, voluntary; but, more than that, it is persistent. Psychologist Michael J. Apter (2001) discusses the various levels of motivation that drive people to voluntarily accept challenge in his thoughts on "reversal theory," a categorization since applied by Jesper Juul to distinguish between the emotional states of people who play a game as opposed to those engaged in everyday tasks. Juul notes how "people seek low arousal in normal goal-directed activities such as work, but high arousal, and hence challenge and danger, in activities performed for their intrinsic enjoyment, such as games" (Juul, 2008, p. 249).

Experiencing the Right Level of Difficulty

In its ideal state, then, challenge—characterized by the obstacles that attempt to impede player progress—is directly proportional to the pleasure gained through playing. The navigation of Test Chamber 08 or the hunt for pigeons each offer voluntary engagement with individual challenges if the perceived effort of completing that challenge is met by the player's sense of satisfaction and reward. Desirable challenge in video games therefore matches the sense of achievement the player feels in surmounting it.

This is similar to an observation made by T. W. Malone and M. R. Lepper (1987), who suggest that part of the reason why children have fun playing games explicitly designed for educational purposes is because their challenges appeal to the player's desire to complete set tasks. As in Apter's reversal theory—which observes that a person's willingness to accept a challenge is linked to the amount of pleasure that person will derive from tackling it—Malone and Lepper recognize that the lure of games is in their capacity to offer levels of arousal hard to obtain in daily life, but they add that a game's challenges are particularly enticing because they are clearly set out for the player, so that the conditions for success are fixed and easily understood. They also state that games should offer continuous feedback on player performance so that there is a definite sense of progression toward the completion of a goal. So during Niko's hunt for pigeons, a written message appears on-screen after every kill, both confirming the player's progress and clarifying how many pigeons remain. That the pigeons are also hard to find fits in with another of Malone and Lepper's conditions of challenge: playing a game, they note, should be a process of discovery, so that games that offer suitable challenge should withhold information that must be found by the player.

Malone and Lepper enlarge upon the generalizing claim that challenge in the video game is defined by rules and obstacles, and the voluntary employment of one to overcome the other. Indeed, the description of video game challenge as characterized by clear goals, hidden elements, and constant feedback corresponds with another theoretical strand advanced by the psychologist Mihaly Csikszentmihalyi, in particular his book *Flow: The Psychology of Optimal Experience* (1990).

Csikszentmihalyi's idea of "flow"—again conceived in a non-gaming context to examine the habits of artists who are seen to become "lost" in the act of creativity—is highly influential as it illustrates the conditions by which a person becomes engrossed by an activity. Like Apter's recognition of the difference between work and play by the levels of arousal each activity stirs in a person, *flow* distinguishes a state of awareness that goes beyond mere engagement to describe a condition of immersion in which a person is compelled to actively, and continually, pursue a task.

Challenge is an integral, motivating factor for the person immersed in an activity, and flow becomes an "optimal experience" when a challenge is neither too difficult to provoke anxiety for a person, nor so easy that it becomes boring. For Csikszentmihalyi, then, flow is imagined as a narrow channel between the conflicting emotional states of anxiety and boredom wherein a person experiences the best possible sense of immersion. But rather than being conceived of as static, flow operates on a trajectory that acknowledges a person's capacity to become better at a task over time; thus, as a person's competence in a task increases, so does the demand for greater challenge. As Noah Falstein (2005, 2009) writes, in specific reference to the video game: "Boredom occurs when the challenge of a game does not increase in difficulty and variety fast enough to keep the player engaged, and frustration occurs when it gets *too* difficult too fast" (2009, p. 17). Flow, as it pertains to video games, then, intensifies the anxiety in challenging situations, but only enough to maintain the player's state of blissful attentiveness and intense pleasure. To achieve flow in playing a video game, however, it is not necessary to steadily increase the difficulty of individual challenges on a predictable continuum: Test Chamber 08—which as its number implies is encountered some way in to *Portal*—does not necessarily have to be the easiest nor the hardest section in the game. In applying Csikszentmihalyi's theory specifically to video games, then, Falstein suggests that the channel the player navigates between anxiety and boredom should not progress at a predictable rate, but fluctuate over the course of the game. As Juul states, "difficulty should vary in waves" (2008, p. 247); reinforcing a point also made by Malone and Lepper that games should offer flexibility in their levels of difficulty (1987, pp. 223–253).

The concept of video game challenge—that "sometimes the game should be a little easy, sometimes a little hard" (Juul, 2008, p. 247)—operates contrary to the player's desire. The player's ultimate desire is to be successful in facing a game's challenges, because failure leads to feelings of sadness and inadequacy, but failure also "makes the player reconsider his/her strategy (which makes the game more interesting)." Juul continues: "Winning provides gratification [but] [w] inning without failing leads to dissatisfaction." Following Csikszentmihalyi and Falstein's thoughts on flow, Juul adds that optimal player engagement is achieved both through the activity of overcoming obstacles *and* the interpretation of gameplay as balanced experience. Juul differentiates between the "desire to win" as active experience and an "outside view" of that experience that appears as "an aesthetic evaluation" of the game's inherent fairness (pp. 248–249). Both are necessary states of awareness that the player must experience to ensure the right level of challenge has been met.

Emergent Challenges and Progressive Structures

As concepts of challenge are more readily applied to the relationship between video game and player, so the types of challenge games offer become demarcated. The examples of gameplay described at the beginning of this essay certainly fulfill the criteria for challenge already discussed—willing struggle against obstacles; a combination of simplicity and difficulty in surmounting those obstacles; a sense of fairness—but they are not challenging in precisely the same way. Niko Bellic's hunt for pigeons takes place in an open world and has no bearing on the character's advancement through the game's story: it is an ancillary activity. However, Chell's solving Test Chamber 08 is integral to completing the game as there is no other way to progress to the next section. Juul identifies these two types of challenge as, respectively, examples of "emergence" and "progression" (2005, p. 67). Emergence challenges offer a greater deal of flexibility to players in solving them, whereas progression challenges are far more rigid in their structure, so there will only be very few—or, indeed, only one—correct way(s) to proceed.

The differences between these two game types exist in the relative freedom each gives to the player. The miscellaneous objectives in *GTA4*—of which pigeon-hunting is only one—are entirely discretionary and can be picked up and dropped at any time. Emergent game systems offer variety—the term "sandbox" used to describe open world games such as *GTA4* presents an ethos based on player empowerment—so that players might design their own tactics to deal with challenges, or even develop challenges of their own. Game designer Randy Smith (2011, p. 120) describes how a player of the stealth/action game *Thief: The Dark Project* (Eidos Interactive, 1998) approached a simple mission to steal a jeweled scepter from a mansion by bludgeoning the guards unconscious, and then arranging them and several bottles of wine around the banqueting hall to give the impression a drunken party had taken place. This player's outlandish approach to completing a mission objective indicates not only a willingness to engage with the game's challenge, but also the creation of an additional level of challenge presumably not considered by *Thief*'s developers.

Juul identifies the challenges evident in *GTA4* and *Thief* as emergent because they are constructed by the player from the games' existing rules and mechanisms. Emergence games offer variety as players develop tactics for dealing with challenges and are, in fact, the "primordial game structure" (2002, p. 324). Following John Holland's description of an older, non-digital game such as chess as an emergent system in which "the whole is indeed more than the sum of its parts" (1998, p. 14), Juul concludes that emergence exists in the video game too, so that "simple rules present challenges that extend beyond the rules" (2002, p. 324), with players interpreting a game's toolset in varying ways when confronted with that game's obstacles. "Complex gameplay" therefore radiates from simple rules (Juul, 2002, p. 328); relatively straightforward instructions—such as find the scepter without being seen in *Thief*—can consequently engender a variety of creative solutions.

Against the variations possible in emergence games, games of progression are highly linear: "the player has to perform a predefined set of actions in order to complete the game" (Juul, 2002, p. 324). "Progression structures" are a much more recent phenomenon than emergence ones, since the concept of emergence has been a facet of games long before the invention of the video game. Chess, for example, allows the development of complex emergence structures, offering seemingly limitless ways for a player develop strategies and win. By contrast, video games are able to contain narrower progression structures because the designer can set the challenges, limit the tools available to the player to overcome them, and ensure there is only one available solution (2002, p. 324). Juul notes this linearity is prevalent in puzzle and adventure games such as *Myst* (Cyan, 1993)—and, of course, *Portal*—in which a set amount of actions must be completed in a specific order so that the player might complete a level and therefore progress through the game, but states that even in emergence games there exist progression structures. In an open world game such as *GTA4* it is possible to state that "some events can still be determined or are at least very likely to happen" (2002, p. 327)—so that if Niko fires a gun in a crowded street it will alert local policemen to his presence who will consequently try to capture or kill him—an observation that echoes Suits's earlier point that the overcoming of obstacles is reliant upon the player's awareness of and willingness to abide by the game's rules. Emergence games may loosen the designer's control over the precise ways in which the player might tackle a challenge, but the outcomes—to a greater or lesser degree—remain possible to predict.

Juul differentiates between games of emergence and games of progression by the ways in which the guides designed to assist the player are written: "Progression games have walkthroughs: lists of actions to perform to complete the game. Emergence games have strategy guides: rules of thumb, general tricks" (2002, p. 328). However, beyond the useful delineation of challenge structures, the existence of walkthroughs and strategy guides offers further nuance to the concept of challenge in video games. Clearly, when describing the player's engagement with a game, the appropriateness of challenge is dependent upon a person's competence as a player, and—to take Csikszentmihalyi's flow as an example—on individual thresholds of anxiety and boredom. Whether a game is too easy or too hard is entirely subjective, although early games such as *Defender* (Williams Electronics, 1980)—many of which began in the arcades—are regarded as extremely punishing because they are potentially endless and player failure results in restarting the entire game. Such games offer challenge akin to a gauntlet tossed in front of the player regarded as proficient enough to accept it. Such images of challenge as a call to arms are suitably epitomized by the promotional material for the action role-playing game *Dark Souls* (FromSoftware, 2011), whose tagline reads: "Prepare to Die."

Choosing Difficulty Levels, Cheating and the Removal of Challenge

Despite the existence of titles that cater toward a perceived gaming elite, many video games accept that challenge is entirely personal. Adaptable levels of challenge have consequently been part of the structure of games since the popularization of consoles, evolving from the inclusion of "difficulty switches" built into the hardware of the Atari VCS 2600 console in the late 1970s, and—in a trend that continues to the present day—the introduction of "Novice" and "Expert" levels in many games of that era, such as *Pac-Man* (Namco, 1980). More recent games, such as the *Halo* series (Bungie Studios, 2001 onwards), offer multi-tiered options to the player—ranging from "Very Easy" to "Legendary"—while others allow the player to set difficulty levels for the different types of challenge the game presents. For instance, certain entries in the Konami *Silent Hill* games, such as *Silent Hill 2* (2001) and *Silent Hill: Downpour* (2012) distinguish difficulty settings for the "Riddle" and "Action" levels. In this way, games provide low-level entry requirements for their challenges, further differentiating players between perceived casual and hardcore audiences.

The choice of lower difficulty levels is one way in which challenge might be reduced, but there are others. Console games frequently include checkpoint systems, and PC games allow free saving options so that players might suffer only minor setbacks in their advance through a game. The environments in *Portal* are small enough so that, even if Chell dies, the game will restart at a checkpoint the player will remember from seconds—or at most, minutes—before the fatal mistake was made. Moreover, certain games—such as the 2011 re-issue of the 1998 Nintendo 64 game *The Legend of Zelda: Ocarina of Time* on the company's handheld 3DS platform—include a hint system that pops up if a player appears to be struggling to complete a section, while others allow players to skip a difficult challenge entirely—for example, an action sequence in Rockstar's *LA Noire* (2011)—and proceed to the next.

The popularity of strategy guides and walkthroughs also reveals a trend in the relationship between player and game in which challenge as a negotiation of obstacles can be circumvented by the player's foreknowledge of what the game has to offer. Mastery of a game is possible through many other means too, including, as Mia Consalvo confirms, "hacks, cheat codes, online sites, help from friends." In addition, commercially available software—such as the GameShark or Action Replay—unlocks hidden data that reduce players' chances of failing a game's challenges (2007, p. 87). Moreover, games such as Zynga's *Farmville* (2009) and Rovio's *Angry Birds* (2009) include opportunities for players to complete challenges much more easily by paying real-world money to vastly improve their chances in overcoming hard-to-complete challenges.

Suits writes that

> the attitude of the game-player must be an element in game playing because there has to be an explanation of that curious state of affairs wherein one adopts rules which require one to employ worse rather than better means for reaching an end.
>
> (2005, p. 52)

Here, Suits is continuing his thesis that games are essentially challenge-based structures built around the player's compulsion to adhere to an impractical method of achieving an end, but this is compounded by the player's willingness to "cheat" the game's rules or find shortcuts to completing its challenges. The strategy guide for *Dark Souls*, for instance, includes on its back cover a play on the game's own tagline: "Prepare to Die Less." Moreover, as more interactive titles are released—such as *The Path* (Tale of Tales, 2009) or *Dear Esther* (thechineseroom, 2012)—which are primarily designed as aesthetic experiments with no obstacles to overcome, the definition of a game as an optimal experience testing player skill is itself being challenged. As Consalvo writes, quoting a GameShark advertisement from the 1990s: "Can you still call it a game if you never lose?" (2007, p. 66).

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19

CHEATING

Mia Consalvo

Introduction

Cheating in video games has existed largely as long as games themselves have been around, and has proved to be a dynamic and controversial practice. Yet the history of the game industry demonstrates that some forms of cheating have been actively encouraged by game developers, while others have been vigorously curtailed. Players themselves have conflicted feelings about cheating, and the practice itself is notoriously difficult to define and identify. While some events, practices, and attitudes are clearly defined as cheating by a majority of players and developers, others are in flux, and new ways to cheat and beliefs about cheating are constantly evolving. This essay reviews some of the history of cheating practices and definitions of cheating, and also discusses how new game platforms and player demographics are starting to redefine what is cheating and what it means in larger video game culture.

Origins of Cheating: Developer Practices, Player Discoveries

One of the earliest instances of cheating in the video game industry occurred when a game developer decided his company's crediting practices were unfair to those who actually made the games. Warren Robinett worked for Atari, a company that did not believe in letting developers take credit for their work by associating their names with the games they created. To retaliate, in 1979 Robinett cheated by hiding his name in the game he was coding—*Adventure*—and making it only viewable if the player found a pixel-sized key in the game, picked it up, and brought it to a particular room. If the player did so, Robinett's name appeared in strobing colored letters. Robinett revealed his actions to no one at the company, and the game shipped with the "Easter egg" intact. Dedicated players soon enough found the secret and his cheat was revealed, creating the expectation for such elements in future games. Ironically begun as a hack and a protest against game industry practices, the addition of such secret elements ultimately became a normalized part of games, and led to additional commercialized elements of the industry that were built around helping players identify and find such elements (Consalvo, 2007).

Another way that developers helped contribute to the culture of cheating in video games was through the addition of "cheat codes" in games. Such codes are a normal part of game development, as they allow developers to skip around a game's levels, delete monsters or items, add certain elements, and so on. Sometimes those codes are deleted or disabled before a game is publicly released, but more often they remain intact, particularly in single-player games where they won't upset the balance of play between multiple players. In those instances codes can add further life and interest to a game, as players work to figure them out, search for them online, or purchase them in magazines or elsewhere (Consalvo, 2007).

Over the years, cheating in games has become more complex, as players discover loopholes in code, exploit the weaknesses of platforms, and engage in social engineering. What follows is a brief review of the major forms of cheating that players encounter in contemporary video games: FAQs and walkthroughs, cheat codes, hacks and exploits, and social engineering.

One of the most common forms of cheating in video game play is the use of strategy guides and walkthroughs or FAQs. Such elements have a long history in the video game industry, particularly as games evolved to become longer and more complex. Yet even early games such as *Pac-Man* (Namco, 1980) had guides written about them, usually offering a bit of strategy and then a succession of screen maps detailing the correct maze patterns to use in order to clear successive screens in the game. Similar guides for games such as *Donkey Kong* (Nintendo, 1981) and *Super Mario Bros*. (Nintendo, 1985) were likewise light on description or narration, instead offering the player maps of game worlds to memorize in order to plan the best route to victory. As games became more complex, and particularly as they entered the home via consoles, a different approach emerged for such guides. For example, early guides for games such as *The 7th Guest* (Trilobyte, 1993) and *Myst* (Cyan, 1993) offered players solutions to the puzzles the game employed, but delivered them via narratives that encouraged the player to see themselves as a character in the game world. Written as diaries or journals of the protagonist in the game, such titles also employed subtle cues and clues to guide the reader toward solutions rather than simply presenting them. Yet such guides also provided more utilitarian help in the backs of the books—there presenting the answers or solutions, without pretext to an alternate fiction or world (Consalvo, 2007).

Over time most strategy guides dropped such fictional narratives, instead focusing on the details of how to help players solve puzzles, beat bosses in battle, and find hidden treasures and eggs in games. Guides became vitally important with genres such as the role-playing game, known for including many hidden elements as part of the gameplay. Companies such as Square in particular worked to make the purchase of guides a nearnecessity, particularly if players were intent on finding all of the secrets and items in a particular game. While full color print guides do still exist, far more commonly used now are the less graphically lush—but free—versions of walkthroughs found on sites such as www.gamefaqs.com. Created by players themselves and rated by others for their accuracy and completeness, the FAQs are designed for easy access to specific levels or areas, and purport to offer players the most direct routes or strategies for successful gameplay. Creators must spend significant amounts of time creating their documents, which often go through multiple versions and can be perpetually updated if new information is found relative to the game and its gameplay. FAQs tend to be complete walkthroughs of a particular game, although some focus more specifically on one game element, such as a game's bosses, particular mini-games, certain hidden quests, or the collection of particular items, among others. FAQs continue to play a vital role in video game culture, as they respond to the needs of players who will all, inevitably, need help at some point while playing a game (Consalvo, 2007).

As mentioned above, cheat codes have long played a role in the history of cheating in video games. Most codes start as developer aids for testing games, and remain hidden in the games after they are released to the public. Codes can be both functional and playful, helping players along in the game as well as adding fun, unnecessary items. For example, some codes will make the player character invincible or will remove all enemies from a level; others will grant access to all items in the game immediately, or add items not normally in the game—such as a bicycle to ride in *Crazy Taxi* (Hitmaker, 1999) rather than a traditional car. Codes can allow a player to move past an obstacle that is too difficult, they can allow players to instantly have access to everything in the game, or they can add new life to the game by adding new elements. The most famous cheat code was Konami's "up-up-down-down-left-right-left-right-B-A," which was used in several of its games. Cheat codes have become an expected part of single-player games, but are largely removed or disabled from multiplayer games, as they would give those with the codes an unfair advantage.

Moving along the scale of technological sophistication are hacks and exploits. In this category players create small programs or alter the code of a game in order to gain advantage, or they examine games closely to find weaknesses in the code or its network processes, if the game is online with a client/server architecture. Some of the most famous hacks involve online multiplayer shooter games, where players figure out how to alter the game's code in order to see through walls (wall hacks), aim guns automatically and more quickly than they could on their own (aimbots), or remap the textures of their opponents to make them easier to identify or remap their own textures to make themselves invisible. Such cheats usually involve intercepting information about the game that moves back and forth between the player's computer and the game's central server. In response, companies have employed numerous tactics. In addition to monitoring game servers and player forums to find active instances of cheating, many companies now employ additional software such as Even Balance's PunkBuster program (www.evenbalance.com/) that the player must install on their computer in order to play the game on public servers. The software constantly monitors the game for alterations, and if detected, the offending player can be kicked out of the game, suspended from play for a certain period of time, or even banned permanently from play.

A somewhat more contested use of technological changes is the category of exploits. In these cases, players are not actively changing the code of a game, but are instead trying to find weaknesses in the game itself in order to gain advantage. One of the most famous examples of an exploit is rocket jumping. In various first-person shooter games from *DOOM* (id software, 1993) through *Halo: Combat Evolved* (Bungie, 2001), players discovered that they could fire a rocket or grenade launcher at the ground and propel themselves higher than they could by jumping normally. That trick led them to access areas of the game not normally accessible to players. The practice has become so entrenched that it is now considered a normal part of gameplay, but players do often contest the legitimate use of exploits and debates occur about which exploits are acceptable and which are not. Likewise, game developers can take a more-or-less tolerant approach to player uses of exploits, sometimes allowing their use, and other times punishing players and/or removing glitched code from the game.

A final area of cheating comes not from exploitation of games' technology, but from players' exploitation of one another for their own gain. Players can collude with one another to bilk others out of in-game currency or items; they can trick others into giving them their passwords; and they can deceive others into giving them items or cash, under false pretenses (Fields & Kafai, 2009). Some games are quite strict in what players can do in relation to other players, while certain games take an anything-goes approach. The best example of the latter is *EVE*

Online (CCP Games, 2003), which allows player collusion, confederacies, espionage, and more, all in the name of legitimate gameplay.

Why Do They Do It?

Most players prefer not to cheat in video games, and many will go to great lengths not to do so. Yet almost every player at some point in their game-playing history has cheated and will do so again in the future. The reasons for doing so vary by player and by situation, and most players have certain limits on what they will or will not do. All players see cheating as gaining some sort of unfair advantage in a game, so why would they take part in that advantage?

The most common reason that players cheat in video games is because they are stuck. A certain level or puzzle may be too difficult, a boss may seem unbeatable, a game may have a glitch or difficulty spike, or a new genre or type of game is presenting a greater challenge than they had thought. How long players will persist in the face of such difficulties will vary, but all unsuccessful players eventually reach a point where they must decide whether to cheat and advance, or give up the game. Most of the time being stuck requires the player to ask a friend or family member for help and/or advice, consult an FAQ or strategy guide, or even use a cheat code to get past a troublesome spot in a game. Players often have varying answers for what they consider as acceptable “help” and what is not—for one player, help via a guide may be okay, while use of a code is not. For another, using a code is fine, but having another player complete a level for them would be cheating. Whatever the case, players might have to resort to various methods, but usually do so sparingly—they do not like to “cheat” in such ways, for one main reason. Using a code or looking up the answer to a puzzle in an FAQ deprives the player of the sense of accomplishment that comes from doing so on their own, without help. While the larger game challenge is still available to them, that smaller element has been lost. Players often talk of “cheating themselves” out of a surprise or achievement when they cheat in a game, and this is why. Though this type of cheat is mainly instrumental—helping a player get back into gameplay—it is still considered undesirable unless absolutely necessary (Consalvo, 2007).

A second reason that players cheat in games is to play God. Players sometimes wish to experience all a game has to offer, without going through all the in-game steps prescribed by the game’s developers. Often players will state that they wish to do this “after playing through the game once already” as a way to indicate they have *earned* this particular ability—although not all do so and wish to gain access to those elements immediately. Cheating here usually involves the use of codes to gain access to all items, all levels, or secret areas and goodies that game designers have put into the games. It is also mostly confined to single-player games, where such codes still work. Cheating in this instance is more ludic than instrumental—allowing players to “play” at the game in ways that are not a linear part of the gameplay. Most players acknowledge this isn’t the normal or expected way to play a game, but do voice their desires to play in this way, at least part of the time (Consalvo, 2007).

A third reason that players cheat is to “fast-forward” through content they view as uninteresting in some way. This type of cheating is akin to tiring of a mystery novel, but flipping to the last page to discover the answer to the mystery in order to attain some sort of closure. Players who engage in fast-forwarding will explain they are bored or tired of a game but want to know how it ends; they wish to complete a certain level or quest that feels too long, or there is some item that is taking too long (in their estimation) to attain. In these situations we see the designers' frameworks for gameplay differ from the players', who have a different set of expectations for the appropriate amount of time to invest in parts of a game, or a different engagement level with the game as a whole.

Players who engage in fast-forwarding take several routes to achieve their goals. One method for advancement is the use of saved games that are acquired from other players (or cheat codes like those discussed above). These let players skip forward to elements of the game they wish to experience and past the parts that do not satisfy them. Perhaps the most common way that players fast-forward through games, particularly in the world of massively multiplayer online games (MMOGs), is through the purchase of virtual currency. For example, in a game such as *World of Warcraft* (Blizzard, 2004), the game offers many quests that take multiple hours to complete, including raids for rare gear, the ability to purchase rare mounts, and the leveling of a character itself. Some players wish to move past such elements, not seeing the "journey" or time required as part of the fun of the game but instead it is an impediment to their enjoyment. So rather than invest dozens of hours to achieve such elements, they invest some cash to purchase the desired result. Traditionally such currency transactions have been illegal, although more and more MMOGs (and online games in general) have moved to a free-to-play model, which has incorporated the fast-forward system into the game's legitimate economy. What this means for attitudes toward cheating will be discussed shortly.

Finally, players may cheat, particularly in multiplayer games, in order to get ahead by any means necessary, and by disregarding other players. For many players, the true definition of cheating must include other people—one cannot "cheat" a PlayStation, for example, or cheat oneself in any real way, except out of the challenge of doing it on your own. For such players, cheating is ironically a social act—it only comes into existence when other players are present. Cheating can then occur in a variety of ways, in both online and offline play. It may include peeking at your neighbor's screen in split-screen play, or not fully explaining the rules of the game to a new player. In online play it can include hacks and exploits, and social engineering. This form of cheating is intended to move the cheater ahead by any means necessary, although some players do feel that you need to "earn the right" to cheat in such a way by being an expert in the game. This type of cheating is also distinguished from griefing or griefplay behaviors. Such activities are also present in multiplayer games and are designed to annoy or upset other players. While multiplayer cheating likely does also annoy and upset other players, griefing is centered mainly on the act of upsetting others—it is the reason to engage in griefing. While the griefer may indeed get ahead in the game, that is not the central intent, while for the cheater, advantage is the key. So while griefers and cheaters might look similar in some instances, their goals differ greatly (Blackburn et al., 2012).

Cheating 2.0

The rise of new platforms for gameplay and the greater variety of players that have emerged since the appearance of games on social network sites and as apps on mobile devices has led to interesting shifts in how players think about and approach cheating in video games. One of the key changes has been due to the shifting business models for games—for example, games on Facebook are free to play, and developers have created new ways to earn revenue from players. Rather than charge for subscriptions, most games feature advertising, but also (and more importantly) have integrated and legitimated the use of virtual currencies in their games. This has affected reasons for and opportunities to cheat in at least two ways.

The most central way that virtual currencies affect cheating is through the use of cheats as fast-forward devices. Previously games were constructed to force players to invest varying amounts of time in a game, in order to progress. Players not wishing to spend the appropriate amount of time could either stop playing, or perhaps cheat in some way to push past the barriers. In social network games and other free-to-play (F2P) games, the fast-forward has been institutionalized as a featured part of gameplay. Thus players can "grind" through farming crops in *Farmville* (Zynga, 2009), or levels in a F2P MMOG, or they can purchase in-game currency to shorten the time required for those processes. What was once an illegal activity is now one encouraged by developers, and built into the structure of the game itself. While players are not forced to purchase currency in order to advance, it can greatly lessen the tedium players feel about certain gameplay elements (Consalvo, 2010).

Another aspect of cheating affected by the influx and normalization of virtual currencies is the ludic cheat of playing God. Players who spend real money in social network and F2P games can also gain access to items, levels, and gameplay that "free" players cannot. Such artifacts can help players advance or may simply be decorative in nature. Either way, other players can see who has purchased those elements, usually defined as exclusive in some way. Players often spend relatively small amounts of real currency to purchase items, but are then given access to things other players are not. The ludic cheat is here reinterpreted as access to exclusives, only available this time via currency rather than code (Dumitrica, 2011).

What those changes mean is that for many players, the definition of cheating has shifted slightly. While cheating still connotes an unfair advantage, the methods of gaining that advantage have shifted. If everyone can purchase a fast-forward, it isn't by definition unfair, particularly if the game's developers have created it and marketed it as such to the players. Players take their cues for what they see as unfair from developers and how they reward and punish player actions. Thus, what players see as cheating or not is changing—at least in newer types of games. How definitions and types of cheating will continue to evolve as games themselves change are key aspects of game culture to be studied as games and players evolve.

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20

COMPETITION AND COOPERATION

Emma Witkowski

Introduction

Within the study of video games lies a combination of various player practices, technologies, game structures, narrative elements, win conditions, and co-created performances and productions. With such an array of forms and cultures of play squeezed under one helm, writing about competition and cooperation from a game studies approach is no small endeavor. Take, for example, what is perhaps the most clear-cut competitive and cooperative game practice, the team sports video game that brings systems and cultures of play together with an emphasis on "us versus them." *FIFA 12* (Electronic Arts, 2011) demonstrates one of many ways that cooperation and competition can be combined in a video game. The association football video game presents cooperative and competitive, and single or multiplayer, modes of play on a variety of platforms, showing how different the configurations of competition and cooperation can be. The scoreboard, a standard in sports video games, is an insistent reminder of who (or what) is winning. Opponents might be seated together on a living room sofa, supporting (or goading) one another with tips (or light-hearted jests), impressing each other with elaborate moves, laughing over botched performances, or sharing turns on the controllers (Heide Smith, 2006; Newman, 2004). At the same time, an identical copy of game software can also be played under the formal organization of e-sports (electronic sports) leagues, complete with tournament and local rules, official records, online rivalries, spectators, and trained (human) match referees. The international competitors might otherwise engage in soundless performances of instrumental play going "for the win," or by trashtalking their way to a victory spectated by thousands online.

FIFA 12's surrounding environments are punctuated by overt competition. In various amateur tournaments, online ladders track the leaderboard of players connected to *Xbox LIVE* (an online multiplayer gaming service for *Xbox 360* users). Players can compete for "accomplishments" (such as making two headers in a match), which are recorded to a player's online public profile. A point system is even at work post-game, where competitors can award "reputation" votes to their opponents—a particular form of cooperation and social management that works to maintain players'/teams' status in their tournament environment. What *FIFA 12* and its various cultures of play indicate is the extensive and dynamic assortment of situations, people, expertise, rules, locations, and other effects that feed into the competitively and cooperatively played game.

This essay presents the central sociological, philosophical, and design perspectives surrounding what is a complex assemblage of competition and cooperation in games. These three disciplinary standpoints map out some of the core tenets of competition and cooperation in video games, but also work as links between the studies of games more broadly. As such, this chapter also refers to work in sports studies in order to incite deeper consideration of these two traditional concepts that pertain to the structures, experiences, and cultures of games. Though first it must be asked: what is competition and cooperation in video games?

Cooperation in Games

Under formal terms, games include a process or structure with a conflict or competitive element —that which makes them identifiable as games (see Salen & Zimmerman, 2004). Within this simple framework, the inter-relationship between cooperation and competition in video games has an ontological foundation. Or, as game designers Salen and Zimmerman (2004) state, “[t]he very act of playing a game is an act of cooperation” (p. 256). Is cooperation also at the heart of games, and if so, how does it look?

Working toward common goals and sharing in the exploits and achievements on reaching an objective successfully are frequently heard renditions of cooperation in games (Cody, 1979; Adams, 2010). This brings to mind teams that post their videologged games on YouTube, revelling joyously after defeating an infected horde/endgame boss/other team; the collaboration of live action role players who “delight in” experiences of hopelessness, disempowerment, and tragedy created within the game event (Montola, 2010); or individuals who share play experiences on forum threads, participating in unravelling a hard-hitting non-player character’s game mechanics. In such positions, the rhetoric dramatized by cooperative play is steeped in the positive values of social unions, where the potential gains of collaboration are rendered by and large as outweighing any possible downsides. However, by digging deeper into the experiences, cultures, and structures of games, cooperation is rendered as a far more complex and nuanced play variant (DeKoven, 1978). Reaching common goals together can, for example, be deemed necessary by design; i.e. massively multiplayer online games (MMOGs) often require that players team up in order to experience certain areas of game content. Also, such joint endeavors are oriented by player/community agendas, social norms, or even involve cooperation for less altruistic notions such as reciprocity, those practices inundated by a stance of “I’ll rub your back if you rub mine” (Heide Smith, 2006; Myers, 2010). In this light, acts of cooperation are not always conjoined with the positive values of mutual aid or support, nor are such playful joint instantiations devoid of expressions of power (Sutton-Smith, 1997). Whether or not a player chooses to engage in the range of cooperative (as well as competitive) modes and codes involved in the game is another discussion that deserves careful consideration (Consalvo, 2007; Myers, 2010; Taylor, 2012; Wilson, 2012).

Cooperation as a game structure traverses designs. It includes multiplayer cooperation (where collaboration is needed in order to survive); team-based games (against an environment or against other players where other players are required to cooperate in playing if there is to be a game at all); and hybrid competition modes (where cooperation is “permitted” at times and is an option that players may choose) (Adams, 2010, p. 14), such as in card-swapping and the temporary alliances made in various strategic board games and video games. Cooperation in games extends beyond such traditional structures. In the following examples, players compete against games as artifacts, but also cooperate, on various levels, with the designers toward the formation of the game itself. For instance, as the first players attempting to defeat a new game environment, MMOG end-game guilds challenge patched game content and, as such, the designers of the content. They push at the very limits of the designed challenge (including finding bugs and discovering "unintended" loopholes in game mechanics) in their "world-first" (boss kill) attempts. They are fundamentally involved in shaping the end-game content for those guilds to come. In a more niche case, *Kaizo Mario* (n.d.), a ROM hack, created by T. Takemoto, of *Super Mario World* (Nintendo, 1990), is a game explicitly designed for a specific player (Takemoto's friend) in a way that it challenges him directly (http://kaizomario.techyoshi.com/). The game designer requires not just player effort, but rather, something very specific—that the friend does his best and perseveres. Wilson characterizes this as a "battle of wits and willpower" between player and designer (2012, p. 42). The act is something more than just agreeing to play and as such acting cooperatively. In this case, the game and act of playing is based on and advances the intimacy between the player and designer. A sense of knowing one another is vital in the performance, and winning and losing are rendered as less significant next to the "virtual" touch, push, and pull within the game relationship. *Kaizo Mario* is an evocative case. The competitive game structure is exposed as relying on collaboration (which necessitates intimacy) between designer and player in order for both parties to meet the related goal: that of an experience and performance of togetherness (see Eichberg, 2010). Intimate gameplay experiences between players and designers, as well as between players and unknown others (such as in the anonymous multiplayer structure of *Journey* (thatgamecompany, 2012)), are relatively unexplored in their unique blending of cooperation and competition. Research and design considerations of mutual effort in games would do well to consider these other provocative moments of cooperation, in order to extend our understanding, as well as broaden the range of designs and experiences available, in these modern forms of play (Wilson, 2012).

As various disciplinary footholds exemplify, there is tremendous variation in what is generally termed as cooperation in video games: from the interdependence needed for the execution of collaborative goals in team games, to the co-dependence on rivals who are needed to "play their best" in order for the player to reach top levels of play and demonstrate his or her ability. To be sure, cooperation is a fuzzy term that filters consistently into game design, gameplay, and game cultures, though it is far from the simplified notion of all for one and one for all; and when tied to competition in games, the complexity is amplified threefold.

Competition in Games

Competitive video games are designed with many different formats and flavors of play. Traditional formats include single or multiple players versus the game itself (or computer-controlled characters), team competition, unilateral competition (one player against several others), multilateral competition (where it is "every player for herself"), or straight-up player versus player (Fullerton, 2008, pp. 51–56). Despite the expressed nuances of experience that are brought to such assorted game structures (Jenson and de Castell, 2008), competition is primarily characterized in games as: (1) involving structured rule sets; (2) engaging players with mutually-exclusive goals (of which only one player/team can achieve within a contest); and (3) (often) producing an end-game result that is unpredictable and that reveals clear winners and losers (Adams, 2010; Boxill, 2003; Suits, 1995). With such an emphasis on achievement and winning, especially in well-established Western versions of the concept of competition, it is interesting to look at the root of the term.

Competition (*com-petitio*) means “to strive together”; as implied, this requires other people or things such as environments, time, previous performances, or records to strive with or to quest against in order to compete (Hyland, 1985). The emphasis on striving together is a strong tie connecting competition to cooperation. Sports philosophy, for example, suggests that competition always takes for granted that another or others are involved (though others need not necessarily be present), as one cannot both win and lose against oneself (self-improvement and development are more accurate descriptions of an individual engaging in what is often referred to as “competing against oneself” (see Drewe, 2003, pp. 10–11)).

Competition is firmly rooted in game studies (as well as sports studies) discourse, and most categorically through the work of French sociologist Roger Caillois. In his classification of play forms, a foundational work for the study of games more broadly, Caillois argues that four principal areas of significance work to map out the complexity of games: *agôn* (competitive play), *alea* (chance-based play), *mimicry* (make-believe play), and *illinx* (playing with vertigo). The complexity of these play forms is extended along a continuum of two opposing concepts: at one end resides the improvisational play of *paidia*, while the other end introduces the structured or rule-based activity labelled *ludus* (Caillois, [1958] 2001, pp. 12–13). Caillois’s classifications are richly discussed in game studies (see Newman, 2004; Fullerton, 2008). However, the salience of *agôn* and *ludus* as central tenets within video game competition are worthy of closer consideration from the perspectives of system designs, player practices, and cultures of play.

The relationship between *agôn* and *ludus* explicitly calls forth competitive and structured gaming activities. Taking the competitive principle of *agôn* at its very simplest, Caillois states it is the demonstration of superiority within a defined rule set. *Agôn* speaks to those contests where players can show their ability, where a winner “appears to be better than the loser in a certain category of exploits” (Caillois, [1958] 2001, pp. 14–16). With *agôn* emphasised under such phrases as demonstrating superiority or “the desire to win” (Caillois, [1958] 2001, p. 111), it might be best asked what kind of participation in competition has been silenced or side-lined throughout the term’s pervasive and foundational use within the field of game studies. What does an overt focus on winning (emphasizing winners or the desire to be the winner) do for the actual lived experiences, cultures, designs, and overall nuance of, and rhetoric surrounding, competitive activities?

Game designers readily lean on Caillois, as Tracy Fullerton (2008, p. 92) highlights:

> What is interesting for game designers about this [Caillois’s] classification system is that it allows us to talk specifically about some of the key pleasures of the types of play associated with different types of game systems.… Examining the pleasures of each of these types of play can help you determine player experience goals for your game system.

Such heuristic devices are certainly warranted in the design of such complex systems, and certainly the authors of such practical design tomes are offering only that—heuristics. Nonetheless, it must be asked, first, whether the key pleasures of competition, such as those emphasized by Caillois, are representative of the diverse array of modern networked video game players, and, second, “whose” or what notion of competition is being reiterated through game design and game practice? In this regard, Jenson and de Castell (2008) offer a compelling argument, suggesting that the discourse surrounding competition is groomed from particular users' experiences, where consistent focus is on practiced or expert competitors. "[T]he very idea of 'competition'," they maintain, "… is both gendered and contestable" (p. 17). Expert players, male bodies, and hegemonic masculinities, they find, dominate and direct "legitimized" competitive practices and the pleasures that are considered as central to such game types. Frequently disregarded or relegated in accounts of competition are other experiential features including refinement, laughter, encouragement, talk, failure (and overcoming it), and benevolence—which outlines the elements pertaining to competition in a different light (DeKoven, 1978; Eichberg, 2010; Jenson & de Castell, 2008; Heide Smith, 2006; Witkowski, 2012). In a parallel argument from sport studies, dominance over others may be found as one aspect of competitive endeavors for various players, though for others, or indeed the very same players enjoying those fierce rivalries, it is friendship or togetherness that is at the forefront of their practice in competitive games (Boxill, 2003). I want to tread carefully here, as "winning" and "demonstrating superiority" are indeed principal experiences and pleasures of competitive activities for many players; though, as research on individualist (as contrasted against collectivist) gaming cultures make clear, these are only some of the facets pertaining to competition, and they are certainly not the only way the transient term is lived or conceptualized (Allison, 1980).

As an archetype of the competitive game structure, the *agôn* and *ludus* relationship (and the desire to win) gains further nuance in the research of Jonas Heide Smith (2006) who explores the question "Do players seek to win?" In his study, the dominant models of predicted player behavior (based on game design) as measured against actual player behavior, are explored through a lens of economic game theory. Looking at player behavior in different game structures (cooperative, semi-cooperative, and competitive), Heide Smith finds multiple expressions of behavior that further complicates both competition and cooperation. Cooperative games, for example, can involve aggressiveness and provocation by teammates for "not playing well enough"; semi-cooperative games conversely can find players who attempt to "be the best" at cooperating or who only cooperate for reciprocity; in games clearly marked for player-versus-player competition (i.e. multiplayer racing games), handicapping oneself in order to gain a fairer playing field was observed. This last finding was illustrated in his test group of mixed-experience players, the most practiced of which tapered their play to match the level of competition, literally driving their race car backwards on the track (with moments of shared laughter) in order to recalibrate the challenge and working to keep the "playing climate" positive (2006, pp. 215–219). While players often sought to win in the game, social norms, expertise, and the situatedness of play worked to convolute any pure agonistic desire to win. This last point, regarding the complicating of desire, speaks directly to the alternative qualities of experience found in the variety of player skills and practices.

Alternative Qualities of Experience

The final part of this essay is a reflection on one last Greek-inspired concept pertaining to competition and cooperation in games: arete—the pursuit of excellence. Hans Gumbrecht (2006) delicately handles arete in the context of serious sporting engagements as distinguished from traditional understandings of *agôn*. He explains:

> Arete, by contrast, means striving for excellence with the consequence (rather than the goal) of taking some type of performance to its individual or collective limits … Above all, I prefer arete [to *agôn* as a description of competition in sports qua games] because I think that striving for excellence always implies competition, whereas competition does not necessarily imply striving for excellence … even if we strive for excellence in absolute solitude, we cannot do so without competing against the performance of (absent) others.
>
> (pp. 70–71)

In Gumbrecht's account, arete is encapsulating *agôn*, and, while this has its challenges in any broader use of an arête-inspired competition (are players "pursuing excellence" when they play out of boredom, or as a part of a repetitive training regime for top level competition?), such a consideration questions traditional notions as to the situated experience of competition. Furthermore, using arete as a different lens to consider competition helps illuminate how things such as game goals and player desires filter in and fluctuate throughout the lived experience of competition; or when, how, and why players choose to "play to win," "play towards excellence," or "just play well together" (DeKoven, 1978; Sirlin, 2005). Perhaps the emphasis on the desire to win in competition should be renewed to "aspire to win," since aspire—to rise up—seems the more appropriate verb in sync with notions of excellence. In an early interpretation of excellence in sports, Paul Weiss (1969) furthers the discussion with a more corporally-informed statement on competitive (athletic) performance. He suggests that what we might find in those performances (of elite athletes) is "what we *ideally* are as bodies" (p. 16; emphasis added). I would temper his phrasing a little in order to bring the phenomenologically-toned expression of excellence and competition to a more public level (that is, beyond those few winners and fewer experts). In these arrangements and practices of games, perhaps we, most simply, are just finding out how we are as bodies. In this sense, arete is turned back onto subjective but also collective, inter-embodied experiences (and those aspirations set in a social world), and speaks more to corporeal experience and existence, made of and between competitors, than to desires in play (Eichberg, 2010).

As a facet of competitive and cooperative gaming, the language of excellence adds to the range of alternative descriptors given to the experience of competition, which also includes positions such as undertaking a successful endeavor, or participating and employing one's practiced or newly-honed skills (Heide Smith, 2006, p. 34). Through such extended language, the "stuff" of competition is broadened and a richer sense of the diverse arrangements and understandings of ludic pleasures is gained.

Conclusion

In considering the dynamic and situated processes of competition and cooperation, the phrase "play is personal" is a good reminder of the shifting nature of games not only as designed objects, but also as things that people play, shape, and configure (Witkowski, 2012, p. 173. See also Taylor, 2012; Wilson, 2012). Accordingly, this essay tries to widen the focus of competition and cooperation in game studies just a little, and look beyond its traditional borders. With a broader range of perspectives in hand, the concepts, designs, and player practices belonging to competitive and cooperative video games can be more thoroughly considered. At a time of such burgeoning development and involvement in video games, several areas of game studies stand out as requiring further development. First, further longitudinal qualitative research is needed that builds on the experiences of diverse player practices in various games and game settings. Such studies would broaden the voices available surrounding notions of competition and cooperation in games. This might include (but is not limited to) novice play, practices of marginally-represented players in high-performance gaming competitions, and studies that are sensitive to player/community intersectionality (the multiple dimensions of social categories at work simultaneously such as gender, ethnicity, sexuality, age, and ability). Second, a more rigorous look at the creation and play experience of alternative competition/cooperation game designs would extend the knowledge of designer/organizer/player interactions (such as *Journey*, *Kaizo Mario*, or looking more mainstream, toward the growing international e-sports scene that embraces tailored rule sets as well as diverse attitudes surrounding the spirit of play). Finally, further work is needed on cooperatively designed games' involvement with competition (see Heide Smith, 2006; Chen, 2009). This last concern may seem to pose a tautological error (if all games are competitive, it follows that a game structured on cooperation still implies competition is involved at some level), though by exploring games and game performances weighted (by systems or players) toward cooperation, toward achieving excellence together, and even perhaps toward the making of artistic expression, personal discovery, or togetherness through game performances (see Wilson 2012; Montola, 2010), a broader understanding of how competition and cooperation are designed and played in video games might be reached.

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21

CONFLICT

Marko Siitonen

Conflict at the Heart of the Game

Imagine a game of musical chairs. A group of children is moving around a circle of chairs while music plays in the background. The music stops, and each participant tries to secure a chair as quickly as possible, using speed and agility to beat other players. In the end, one player is left without a chair, and consequently removed from the game. One chair is taken away so as to keep the number of chairs below the number of players, and the game continues. Now imagine the same scenario as before but with exactly as many chairs as there are participants. When the music plays, everyone paces leisurely, certain of having a chair to sit down on. And when the music stops, everyone simply sits down without having to compete for a seat for themselves. Unlike in the first version of the game, however, there is little sense in continuing this one past the initial round. Taking away the conflict embedded in the game essentially makes it a meaningless and, most importantly, boring activity.

Conflict, at least in an open and relatively abstract sense, lies at the heart of games. Conflict is something that turns a simple challenge, such as being able to jump over a high fence, into something much more engaging. In his book on game design, Chris Crawford (2003) illustrates how conflicts between active agents are what set games apart from many other forms of creative expression. In addition to Crawford, several other prominent game scholars and designers have demonstrated the centrality of conflict (or sometimes contest) to the idea of games (e.g. Salen & Zimmerman, 2004; Avedon & Sutton-Smith, 1971).

This essay uses a four-way schema to frame and understand conflict in games. In his book *An Introduction to Game Studies* (2008), Frans Mäyrä considers challenge and conflict as one of the key dynamics important to understand when analyzing games. He separates two main viewpoints into conflict, the conflict between the player and the game and the conflict between players (Mäyrä, 2008, p. 20). These viewpoints form the basic structure of this essay. They are further divided into two variants, intentional and unintentional conflicts. Following this structure, I will first look at conflicts between the gamer and the game. These include intentional conflicts designed into the game, as well as instances where the needs and motivations of the gamer are in juxtaposition to the game, causing an unexpected, and often unwanted, conflict. Second, I will look at conflicts between players. Again, I will approach the topic both from the viewpoint of conflicts that are designed to occur and conflicts that arise naturally, as a part of social interaction between players.

Not all approaches to conflict could be included here. For example, I will not look at the potential conflicts between various interest groups surrounding gaming, such as developers/publishers vs. player communities (such as can be the case with certain types of modding), or the kinds of conflicts that take place within the broad realm of gaming, but outside of the actual game experience (such as platform wars fought among supporters of different gaming consoles). I will also not deal with decision theory, or conflict as seen from the point-of-view of traditional game theory (i.e. in applied mathematics and economics). These, and other viewpoints, remind us of the usefulness of conflict as a lens through which games and gaming culture can be observed and understood.

Conflict between the Gamer and the Game

Some games or game-like activities can succeed while relying on an interesting challenge alone. In practice however, designing artificial conflicts is usually central to game design. As Crawford (2003) puts it, "conflict enlivens and animates challenge; without conflict, challenge is limp and passive" (p. 55). The distinction between a challenge and a conflict is not always easy to make. For Crawford, it is the presence of purposeful opponents that characterizes conflicts.

There are several ways of designing conflicts between the gamer and the game. Some contexts, such as war and sports have become staple imagery of video games. On a concrete level, player-versus-game conflicts can manifest as a struggle with enemy nonplayer characters, the environment of the game, or other factors. The key dynamic is often that of restricting or opposing the actions of the player. From a design viewpoint it is important to remember that conflicts are defined by rules, and that playing by these rules should allow the player to reach a meaningful (and often quantifiable) outcome or result (Salen & Zimmerman, 2004, p. 80).

What is it about conflict that motivates players? One way of answering this question is to see solving conflicts as answering a very basic need in players. Players entering a game want to understand it, and ultimately, to be able to control it. In many cases, the final goal of players is to solve the conflict, or somehow find a balance to an unbalanced situation. This need for balancing the conflict can be understood through the universal drive for reaching closure. Much like we automatically fill in the blanks in an incomplete picture to make it whole in our heads, there is a basic need for orderliness and control in us that can be a powerful source of motivation when used properly. From this viewpoint, the lack of order, or apparent meaning, can be seen as a source of conflict or tension between the game and the player, driving the player to mend the broken picture of the puzzle, or to find a way to balance the infrastructure of an imaginary city on the verge of chaos.

Following this line of thought, a game should afford the player a level of meaningful interaction within its system. This is what makes a game playable. However, it is the level or grade of this interactivity that has an influence on whether a game is not only playable, but also enjoyable. On the one hand, if a game is too difficult to understand or impossible to control, the inner conflict or tension may remain unsolvable. On the other hand, should the game be too simple to master, no meaningful level of conflict or tension may appear. Here we step into the realm of player experience, a subjective and highly varied phenomenon.

Mihaly Csikszentmihalyi's concept of flow (1990) has been widely adopted by game studies scholars. While the concept was not originally developed for this purpose, and is easy to misunderstand and misuse, the idea of a dynamic relationship between an individual's skills or competence and the challenge presented to him or her can be a useful tool when trying to understand games and their players. When is a conflict too hard? At what point is the need to balance a conflict overcome with boredom if the players' actions do not yield meaningful results? Finding a way to balance a player's skills and a game's challenges in a way that keeps the player from becoming frustrated or losing interest is one of the most important tasks in designing viable artificial conflicts in games.

Unintended Conflict between the Player and the Game

Looking at unintentional and emergent conflicts requires a decidedly open definition of the phenomenon. Here, conflict is not seen only as a direct contest or combat between actors, but rather as something more indirect and subtle, along the lines of disagreement, discord, or interference.

A basic type of unintended conflict between player and game can be caused by a mismatch between expectations and reality. It is not hard to imagine a situation where the player wants easy-going entertainment, but is aggravated by a game being too hard or harsh. This, at its heart, is a conflict of interest. One can approach this phenomenon from the point-of-view that play should be safe and emphasize having fun (e.g. Crawford, 2003, pp. 31–32). Yet this is a necessarily limited viewpoint. It is also possible to question the centrality of fun and see that the conflict or tension itself can be of value at times. A game might offer such a frustrating experience that the player reacts physically, throwing the controller to the wall—only to return to the game the next day, determined to overcome the challenge.

Incoherencies and unfulfilled expectations may also cause unintended tension between the gamer and the game (Poole, 2000). A player may be in control of a superhuman character with incredible agility and strength, but still be unable to climb over a cunningly placed dumpster in an alley that marks the end of mapped territory in an otherwise open-ended environment.

There is also significant conflict potential in unexpected player behavior. In their review of cultural studies approaches to digital games, Garry Crawford and Jason Rutter (2006) present several views into how individuals can be seen as truly independent, creative actors capable of "oppositional" readings of games. Players can and will break the rules of games, disrupting the system they are embedded in, and causing conflicts to emerge (between themselves and the game as well as other players) that were not intended by the design of the original game. From cheating to "griefing," this kind of transgressive behavior can be very interesting to study. This is what Salen and Zimmerman (2004, pp. 558–559) refer to as resistance or friction, which can be seen as a form of conflict between the player and the game.

Using words such as friction, resistance, opposition, and disruption when describing unexpected player behavior carry relatively negative connotations. However, as David Myers argues in his essay on defining a minimalist game model, drawing a strong distinction between "good" or "right" kind of play and abusive strategies (the so-called cheater or spoil-sport viewpoint) is not necessary. According to him, since a game must place the players in an oppositional relationship with itself and its rules, it is only the degree of this relationship that changes. In essence, opposition, or contest or competition, is necessary for games to be considered games (Myers, 2009). From this viewpoint, the unexpected conflicts should actually be expected and embraced, proof of the vitality of games and their players.

Intentionally Designed Player-Versus-Player Conflict

Conflict between players can take many forms, from two single players confronting each other, to groups or communities competing, to asymmetric settings. A game can naturally also entail more than one type of conflict.

Video games often enable multiple human actors to participate. In many ways this is the simplest way of including several “active agents” (Crawford, 2003) in the gameplay. These are parties with at least partly juxtaposed interests, goals, and motives. As Crawford notes, while it is certainly possible to create a meaningful conflict between a human player and a computer, in many cases the active agents in conflict are humans. Lankoski and Heliö (2002) discuss the same phenomenon through the concept of characters. They argue that it is through well-defined characters with distinct natures and needs that one creates the basis of conflict in the first place, “their conflicting interests are the basis of action; there can be no game without conflict” (p. 315).

Looking at player-versus-player conflict in its simplest form, many games use a very basic type of competitive conflict. A traditional example of such a conflict is evident in zero-sum games. When played through, this kind of conflict can result only in the victory of one player. Most importantly, for one player to win requires the other player to lose. Of course many games include conflicts that are more subtle or indirect and include several parties and variables, but looking at their basic dynamics, it is often possible to notice the presence of such a basic positioning. This is very much like a traditional view of social conflicts, where the conflict automatically arises between the “haves” and the “have nots.”

A well-designed conflict in a game requires more than a number of active agents with conflicting interests. From the point-of-view of enjoyment, an experience of fairness is important. A fair conflict takes place on a level playing field (Salen & Zimmerman, 2004, p. 260). As hard as this might be to reach in practice, it is clear that taken too far, the feeling of unfairness will result in players leaving the game.

Another useful point-of-view is to consider that to a certain extent, conflict between players requires at least some level of cooperation. This is because most often participation in games is voluntary. For a conflict to happen, let alone happen repeatedly or over a long period of time, the participants must cooperate in creating and maintaining it. There has to be a basic willingness to play, built up and kept up via continuous negotiation (DeKoven, 1978). For example, in a game where the conflict proves to be unbalanced and therefore not enjoyable, it is likely that players will abandon the game before long. From this angle, conflict and cooperation go hand in hand, with the former being dependent on at least some amount of the latter. Salen and Zimmerman, in their reading of DeKoven’s work, call this the idea of cooperative conflict, where cooperation can be seen as something like systemic cooperation that is fundamental to all games (Salen & Zimmerman, 2004, p. 256).

As a final point, it is important to remember that while design choices definitely affect the kind of conflicts a game entails, they do not provide the whole picture. A designer may set up what Lankoski and Heliö call a "tense situation" (Lankoski & Heliö, 2002, p. 313), but it is often impossible to fully predict how players will act the situation out in reality. Salen and Zimmerman (2004, p. 254) also note how seemingly simple design choices can result in rich and multilayered conflicts, with players creating their own forms of conflict via their engagement in gameplay. This kind of emergent conflict is sometimes hard to anticipate, and leads us toward our next topic of unintentional and emergent conflicts.

Emerging Conflicts between Players

When dealing with contexts where a number of people interact and collaborate for a prolonged period of time, conflicts do not, strictly speaking, need to be designed in. They occur as a natural facet of social interaction. Studies on the social dynamics of online gaming groups and communities have illustrated that conflicts between group members are not only normal but also practically unavoidable.

One interesting factor behind emerging conflicts is the variance in motives and approaches that players have toward a game. Sometimes players' conceptions of what the essence of the game is, or how it should be played, are in direct contradiction, causing a conflict between players. One way of understanding this is through the traditional categorization of forms of play by Roger Caillois (1961). For example, let us imagine a strategy game that includes a heavy narrative element and is partly dependent on strategic decisions, partly on chance (or is sufficiently complex that not all outcomes can be predicted accurately). Now, in a tournament or league built around this game, one can probably find players who appreciate the background story and narrative of the game (*mimicry*), players who enjoy the way the game swings back and forth unpredictably (*alea*), and players who view the competition and winning as central (*agôn*). Players can even differ in whether they emphasis the rules and structure (*ludus*), or seek more spontaneous and playful experience out of the gameplay (*paidia*). The interplay of these different viewpoints is not always painless, as players struggle to promote their way of playing the game as the right one.

The simultaneous existence of differing and even oppositional approaches helps to illustrate and understand the tensions between different player types (an idea introduced by Richard Bartle in 1996, and later revisited by many), as well as the discourse on "power gamers" (e.g. Taylor, 2003). Sometimes players accuse others of sacrificing the fun, while others insist that they are simply using the means that the game provides them in order to win. In addition, conflicts between and among players are exemplified in terms such as free riding and unsportsman-like behavior.

In long-term player groups and communities, participants typically engage in a process of negotiating the norms and rules that govern their play. In a way, they enhance or add to the design of the game, creating levels of meta-gaming that go beyond the original or intended game space. Often, this process leads to conflict at one point or another.

In his ethnographic study of *World of Warcraft* players, Mark Chen points out how players are capable of creating social dilemmas (Chen, 2012, pp. 57–58). That is, players manage to create situations where many participants have to negotiate and make choices with interrelated effects. Questions such as how to share limited resources in the game, who should decide on the course of action to be taken, and how to deal with cheating or grief play are typical for player communities. Of course, sometimes conflicts do not need such fundamental issues behind them, but can rather be tracked down to misunderstandings caused by mistypes or technical issues (Siitonen, 2009).

Sometimes conflicts among group or community members can become so fierce that they endanger the existence of the player community. The process of escalating conflict has, for example, been referred to as a “meltdown,” a situation where it is possible that people argued until “irreparable damage occurred to their friendships, effectively disbanding the raid” (Chen, 2012, p. 73). Perhaps because of this possibility looming in the background, or because of the basic orientation of being together for “fun and games,” members of player communities even actively shy away from conflicts (Siitonen, 2009). For example, having a clear set of rules regarding player behavior, and making sure that only players who comply with these rules are let into the community when recruiting new members, can be an effective strategy for managing conflicts preemptively.

Finally, not all conflicts among players are about the game they are playing. Games do not exist in a vacuum, but are rather intertwined with other aspects of human life in all possible ways. Community members falling in and out of love, clashes between different communication styles, and real-world worries and fears affecting people’s behavior are just some examples of possible causes for conflict that end up making a difference within the frame of the game.

The Interesting World of Conflict

Over the course of this essay we have seen examples of both intentional and unintentional conflicts in games. It then becomes relevant to conclude with some examples of views of conflict that can be beneficial both from a design perspective as well as from a research point-of-view.

Since conflict is central to games and gaming, there are several benefits to embracing the concept in all its variance. From a design point-of-view, it makes sense to try to provide as rich a space of possibility for conflicts as one can, in order to support a wide range of conflicts. This is what is said to make a game meaningful (Salen & Zimmerman, 2004, p. 255).

Many games successfully tap into the basic motivation that players have of establishing order over chaos, or making sense of a system that poses challenges to them. As Salen and Zimmerman note, “… formal decisions about the game’s structure directly shape the nature of conflict emerging from the game” (2004, p. 254). While design choices definitely matter, it is good to remember that one does not need to design conflicts for them to occur. Especially in complex systems with an increasing amount of active agents, the sheer range of dynamics of interaction help conflicts to emerge. Quite simply, if a system if complex enough, including a large quantity of independent variables, there is a basic pull toward entropy and chaos.

Looking carefully at the various dimensions of conflict can be useful both when designing and analyzing them. Conflicts have been categorized in many ways, for example into physical, verbal, political, and economic conflicts (Crawford, 2003, pp. 56–59). It is a useful exercise to think of different types of conflicts and how they would relate to existing categorizations. One might add emotional conflict to the previous list, even though it has been less used in video games and is definitely harder to design well than physical conflict.

Other interesting and useful ways of analyzing (and designing) conflicts include looking at how direct or indirect the conflict is, and how intensively it plays out. Regarding intensity, Crawford asserts, “a well-paced game design will rely on more indirect, less intense forms of conflict if it is to last a long time” (2003, p. 61). The intensity of conflict can even be used when analyzing games by drawing a “conflict-tension curve” where the relationship between the intensity of gameplay to time spent playing is illustrated (Friedl, 2003, p. 243).

Whether designed or unintentional, there are many interesting viewpoints to conflicts beyond the scope of this essay. One might look at the way game design can deliberately be abusive toward the player, or the way players might use games as platforms for acting out conflicts in a way that would be difficult or impossible to do outside of the game. From straightforward conflicts between the game and the player to the complicated dynamics of conflicts in meta-games of thousands of players, understanding the role of conflict has a key role in the understanding of games.

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22

INTERACTIVITY

Lori Landay

Interactivity is the potential for, or phenomenon of, interaction; interactivity can be a property of an artifact, a perception, or an experience. *Interaction* is an action that occurs as two or more participants exchange information (people, artifacts, materials, or machines) that has a reciprocal effect on each other. As human experience, interaction can involve the entire body and all the senses and emotions. The most common example of interaction is a conversation between two people, in which each responds to the other in repeated exchanges, taking into account the information in the previous communications. Interactivity in video games or other forms of new media (for example, websites, interactive digital art, or learning interfaces) most often refers to communication between a human and a computer. The person controls a computer system to do something that is meaningful to them; the system changes because of, and responds to, the user's input as one of the participants in the interaction, and there is a loop of information exchanged. The person may perceive that they are interacting with the computer system in a reciprocal way as if they were participating in a conversation. The interactivity of an artifact such as a video game has come to mean part of the user experience, and is closely related to the concept of gameplay in that interactivity encompasses what a player does to engage in the reciprocal-feeling activity with the system.

Contested Definitions of Interactivity

The definition of interactivity has historically been contested, with scholars from different fields emphasizing either technology, the communication setting, or the perceiver, yielding different insights and interests. Seeking to combine approaches, some define interactivity as predicated on the connections between systems, context, and perceivers, such as when Spiro Kiousis writes, "interactivity is both a media and psychological factor that varies across communication technologies, communication contexts, and people's perceptions" (2002, p. 355). Brenda Laurel (1991) explains that in the mid-1980s, the rage for a definition of interactivity prompted her to offer the idea of interactivity as a continuum of three variables: frequency, range, and significance of user choices in a system (1986), but she revised her earlier work to include the perception of participation, a "thresholdy phenomenon":

> You either feel yourself to be participating in the ongoing action of the representation or you don't. Successful orchestration of the variables of frequency, range, and significance can help create this feeling, but it can also arise from other sources—for instance, sensory

> immersion and the tight coupling of kinesthetic input and visual response. If a representation of the surface of the moon lets you walk around and look at things, then it probably feels extremely interactive, whether your virtual excursion has any consequences or not.
>
> (1991, pp. 20–21)

In a similar vein, motion-tracking and biosensor performer and researcher Robert Wechsler elucidates, “we must think of interaction primarily as a psychological phenomenon, rather than a technical one” (2011, p. 62), and adds, “interaction is a feeling you can achieve in a performance setting. It relates to spontaneity, openness and communication” (p. 64). Margaret Morse explains that the “inter” prefix in interactivity is significant:

> *inter*- joins what is other or different together. That liaison between mind, body, and machine, between the physical world and the other virtual scene, requires a translator or *interface*.… One interacts by touching, moving, speaking, gesturing, or another corporeal means of producing a sign that can be read and transformed into input by a computer.
>
> (2003, p. 19)

Definitions categorize interactivity as a property of the system, the medium, the user, or a combination of two or all three. The field of interaction design often encourages a perspective in which the designer thinks about how people will use the artifact in order to work from a perspective that foregrounds the user experience in designing the aesthetics and technical aspects. In discussions of video game design, interaction is necessarily a property of the system, characteristic of the medium, and also the “thresholdy” experience that Laurel discusses above. In video game studies, interactivity is closely associated with “gameplay,” which seeks to combine the three aforementioned properties, and the concepts of immersion and agency.

Nearly everyone discussing the term interactivity mentions that it is not well understood, having suffered from a too-broad application that conflates interaction with any action causing an outcome. Nevertheless, the term persists because it refers to what game designer Chris Crawford argues is

> the very essence of the entire computing experience … the computer revolution that began twenty years ago [*c*.1980] arose from the ability to close the loop with the user, so that input, processing, and output were part of a continuous interaction. Pre-personal computers could handle budget calculations, but the spreadsheet (an interactive budget) caught fire. Pre-personal computers had text-formatting programs allowing users to print out documents, but it was the advent of the interactive word processor that made PCs so compelling.
>
> (2004, p. 45)

Therefore, despite misuse and contested definition, interactivity continues to be essential in video game studies, and it has specific meanings in the fields that inform it—such as computer science, communications, sociology, contemporary art, and design.

Interactivity as Communication and Control, or a Conversation

The loop to which Crawford calls our attention connects to Norbert Wiener's feedback loop. Indeed, at the core of all the different definitions and debates of interactivity are the original tenets of Wiener's pioneering idea of cybernetics. Communication and control still summarize what happens between a user and the computer system when someone plays a video game, whether it be *PONG* (Atari, 1972) in an Atari arcade cabinet, *Tetris* (Alexey Pajitnov, 1985) on a Game Boy, *World of Warcraft* (Blizzard Entertainment, 2004) on a laptop, Mass *Effect 3* (BioWare, 2012) with Kinect, or *Angry Birds* (Rovio Mobile, 2009) on a mobile.

Many scholars discussing video games and new media, including foundational work by Espen Aarseth, hearken back to Wiener's definition of communication as the exchanging of information in order to affect the environment: "information is a name for the content of what is exchanged with the outer world as we adjust to it, and make our adjustment felt upon it" (Wiener, 1954, p. 16). Aarseth borrows "ergodic," a term from physics, to describe the "nontrivial" physical effort necessary for a reader/player to "traverse" the cybertext (1997, p. 1). The physical movements, whether mouse clicks, joystick movement, or kinetic or haptic control, provide input that affects the text, and, in a video game, there can be a direct correlation between what the user does physically and what happens in the game. The feedback loop created by the physical participation of the user, the computer system, and the text (for example, the game) is a particular kind of communication and control. In *Game Feel: A Game Designer's Guide to Virtual Sensation,* Steve Swink details the loop in a process with the player on one side with the first three parts of the process of real-time control, and the computer on the other with the second three: (1) Senses (input); (2) Brain; (3) Muscles (output); (4) Controller (output); (5) Processor; (6) Display (output) (2008, p. 36) (see Figure 22.1).

Interactive architecture systems designer Usman Haque stands in the tradition of Wiener when he explains:

> At its fundamental, interaction concerns transactions of information between two systems (for example between two people, between two machines, or between a person and a machine). The key however is that these transactions should be in some sense circular otherwise it is merely "reaction."
>
> (Haque, 2006, p. 1)

Haque distinguishes between single-loop interaction, in which the outcome is within a "predetermined set of boundaries" and "multiple-loop interactive systems," in which the interaction is like a conversation built up through exchange of information and that each communicator takes into account. There is, for the human, a sense of agency, the ability to effect change. Others concentrating on new media have made a similar distinction between simple (and uninteresting) interactivity and a more dynamic, interactive system. Lev Manovich qualifies the term "interactivity" with "open" and "closed" to indicate whether the user has a role in generating the elements and structure of the cultural object (open) or chooses among fixed elements already ordered in a branching structure (closed) (2001, p. 40).

The elusive quality of "open" interactivity has been expressed by the metaphor of a conversation, of reciprocal human-to-human interaction, despite the myriad of ways that human-to-computer interactivity is not conversational. We find this at the beginnings of definitions of interactivity, with the MIT Media Lab's original working technical definition of interactivity: "Mutual and simultaneous activity on the part of both participants, usually working toward some goal, but not necessarily" (Andrew Lippman, in conversation with Stewart Brand, quoted in Brand, 1987, p. 46). Its five corollaries are: interruptibility, graceful degradation, not losing the thread, limited look-ahead, and the impression of an infinite database. Lippman uses the distinction between a conversation and a lecture to get at the essential ability to change the exchange as it is happening without knowing how it will transpire, to "distinguish between what's interactive, which means mutual and simultaneous, versus alternating" (p. 46). The corollaries mean an interaction between a user and a system that is like a conversation in that (1) you can interrupt the other person for clarification, agreement, or to change the subject and the other person can return to finish the interrupted word or thought; (2) a request that can't be answered can be handled gracefully without stopping the interaction; (3) an overall thread can be kept even when the thread diverges from the original goal of the interaction; (4) the end of the interaction is not preprogrammed but dynamic, like how a person cannot look ahead to see the end of a conversation that hasn't happened yet; and (5) the choices a user can make appear to be unlimited, despite there having to be limitations in the system.

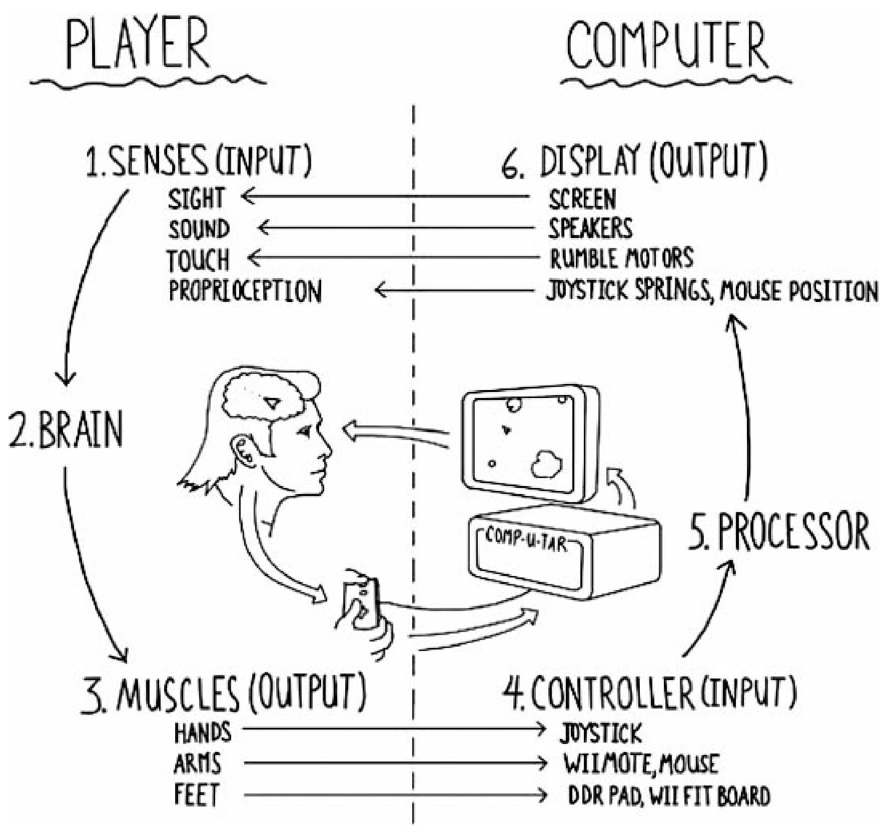

Figure 22.1 Steve Swink's "Interactivity in Detail" diagram shows six stages of an input–output loop between player and computer.

The corollaries in Lippman's discussion are important for interactivity between humans and computer systems in general and video games in particular because those qualities of conversational interaction are what make an experience with an artifact dynamic. For example, when you can clearly see a series of binary choices in a game, there is not enough limited look-ahead or the appearance of an infinite database, and it is too easy and boring. The difficult task facing programmers and designers is to construct games that give the experience of gameplay that has a conversation's reciprocal feeling of exchange of effect. Activity that is not reciprocal, simultaneous, mutual, interruptible, is not interactivity. Clearly, much of what is commonly termed "interactive," including games, art, educational software, video, television, and other media, does not fulfill the more accurate definition of interactivity based on mutually-effecting exchange of information, but has been perceived of and experienced as interactive.

Chris Crawford's influential definition of interaction: "a cyclic process in which two actors alternately listen, think, and speak" (Crawford, 2002, p. 5) most fully articulates the conversational ideal of interactivity, but does the conversational ideal apply to a gamer's experience playing a video game? Often interactivity is equated with the concept of gameplay, as in Richard Rouse's discussion in *Game Design: Theory and Practice*: "A game's gameplay is the degree and nature of the interactivity that the game includes, i.e., how the player is able to interact with the game-world and how that game-world reacts to the choices the player makes" (Rouse, 2001, p. xviii). Jørgensen writes:

> [*G*] *ameplay* is not a feature designed into the game alone, but an emergent aspect of interaction between the game system and the player's strategies and problem solving processes. In short, *gameplay* is how the game is played, delimited by the game rules, and defined by the dynamic relationship that comes into being when the player interacts with these rules.
>
> (Jørgensen, 2008)

"Conversation" with Non-Player Characters

The kinds of "hyperselectivity" so dissatisfying in interactive movies on DVD (Perron, 2003, p. 247) do not feel interactive, and often dialogue with non-player characters (NPCs) is really selecting topics for the NPC to relate, to further exposition. To be sure, there are limitations with chatbot and dialogue tree programming that are continually eroded, and artificial intelligence systems such as Radant AI created for *The Elder Scrolls IV: Oblivion* (Bethesda Game, 2006) and used in the *The Elder Scrolls V: Skyrim* (Bethesda Game, 2011) games enable NPCs to interact with each other and their environment in ways that will undoubtedly become more "thresholdy."

In *Portal 2* (Valve, 2011), NPC Wheatley is a robot who initially accompanies Chell, the human, through whose perspective the first-person player experiences the game. Brilliantly voiced by British actor Stephen Merchant, eyeball-robot Wheatley provides company, comedy, and exposition, but in a surprisingly natural, neurotic, and humanly-flawed way. Given that the protagonist, Chell, is silent, as so many characters in single-player games are, there is no interactive conversation between you/Chell and Wheatley; however he is so cleverly scripted and performed that it feels like he is responding to your choices and outcomes, interpellating you.

The superb writing, programming, and voice acting create a strong perception of interaction.

Artist David Rokeby commented on what it is we seek in interactive media: “Technology mirrors our desires; interactive technologies, in particular, reflect our desire to feel engaged” (Rokeby, 1996). Engagement suggests entertainment, distraction, attention, and emotional affect, but not necessarily what happens in a conversation or a feedback loop. *Portal 2* plays with the desire for engagement, not interaction with other people, to which “interactive” technology appeals (Figure 22.2).

Interactivity, Interaction, and Video Games

Figure 22.2 Wheatley in *Portal 2* (2011) is a programmed NPC reacting to the player’s input, but he has been designed and performed to be perceived by the player as another autonomous participant in an interactive exchange.

Within the field of new media studies (broadly defined), three major approaches to defining interactivity emerge: those that focus on the functions of features of particular technologies; those that focus on processes of interchange and responsiveness; and those that focus on users’ activities, behaviors, or perceptions. The first foregrounds the system, and the second, the user’s experience. Ultimately, the user’s experience depends on the system, and the processes it affords, but whether the user’s experience has to include any specific knowledge of how the system is providing interactivity is contentious (this is where debates about transparency come in). The third views interactivity as an experience or quality as perceived by the participant. Katie Salen and Eric Zimmerman frame their discussion of interactivity in *Rules of Play* with the question, “how does interactivity emerge from within a *system?*” (2003, p. 74) They present a model of interactivity with four modes: (1) interpretive participation that occurs in the imagination; (2) functional interactivity or utilitarian participation through which the player controls the material components, like buttons; (3) explicit interactivity as overt participation with the choices and procedures such as using the joystick or clicking the links in a nonlinear hypertext interactive fiction; and (4) beyond-the-object-interactivity as participation outside the designed system, such as found in fan culture. They conclude: “For our purpose, Mode 3, explicit interactivity, comes closest to defining what we mean when we say that games are ‘interactive’” (2003, pp. 59–60).

The real importance of Salen and Zimmerman’s treatment of interactivity, however, becomes clear when they connect it to “meaningful play,” so that “the depth and quality of interaction” can be characterized by how a system responds to player choice (2003, p. 61), in the relationships between action and outcome. Therefore, although they are focused on the system, they are ultimately interested in connecting it to the player experience, and like many others, implicitly consider agency, the capacity to make a difference.

Degrees of Interactivity

There are other perspectives on interactivity from other fields that can also offer insights for video game studies, including how interactivity is approached in media and communications studies, philosophy, advertising, and education, and each approach leads to different emphases on defining interactivity. In constructivist approaches to designing web resources for education, “interactivity refers to active learning, in which the learner acts on the information to transform it into new, personal meaning” (Campbell, 1998, p. 1). Following this principle, in models of online learning, interactivity equating to active as opposed to passive learning is mapped onto kinds of activities that can be built into course design.

Interactivity is also of great interest to advertisers and marketers, and there are quantitative studies of uses of and attitudes toward interactive media. Ghouha Wu found that people had a more positive attitude to websites they perceived as more interactive (Wu, 1999) and more recent studies (Wu, 2005; Gao et al., 2009) have expanded the focus on perceived interactivity.

To try to address the complexity of interactivity, some have turned to models of relative levels of interactivity. Rafaeli (1988) posed a definition based on “responsiveness,” measuring whether a medium can be receptive and react responsively to a given user. Choice figures prominently in Lutz Goertz’s definition (1995), which has a scale of interactivity along continuums of degree of choices, degree of modifiability, number of selections and modifications, and degree of linearity or non-linearity (Jensen, 1998, p. 197). Carrie Heeter (1989) has six dimensions: (1) extent of choice; (2) effort needed to access information; (3) degree of responsiveness of the media system; (4) potential for registering all user behavior in a form of feedback; (5) degree to which users can add information to the media system others can access; and (6) the degree to which the media system fosters interpersonal communication between its users (cited in Jensen, 1998, pp. 199–200). Jensen offers a definition for media and communication studies: “a measure of a media’s potential ability to let the user exert an influence on the content and/or form of the mediated communication” and extends it with four dimensions of interactivity: transmissional, consultational, conversational, and registrational (1998, p. 201). As touched on above, Haque and others also think about simple and more complex and usually interesting forms of interactivity.

Interactivity in Art and Performance: Insights for Video Games

Interactive art not only encourages but demands that people break the traditional first rule of art spectatorship: don't touch! As in the field of interactive fiction, artist practitioner-theorists as well as scholars have explored and defined interactivity in interactive art, often in ways that can be illuminating for understanding interactivity in video games. In particular, Stroud Cornock and Ernest Edmonds's early (1973) concept of "the matrix," a dynamic art-system in which meaning is made through the process of exchange among the artist, audience, and the art system (or artifact), posits interactivity as the medium of the artwork (Cornock & Edmonds, 1973, cited in Muller et al., 2006, p. 197).

Thinking about interactivity as a medium as well as a property or potential emphasizes the entire matrix of exchanges that includes the audience/player. Moreover, in interactive art, the physical interaction, the haptic or kinetic action necessary for interactive art to be experienced, can either control or influence movement or other elements on a screen, or in a physical space, and a person experiencing interactive art can often be watched by others as performance, performance in the medium of interactivity. In contemporary dance, for example, practitioner-theorists have experimented with interactivity as a medium in which dancers perform, and have written insightfully interactivity in historical or philosophical contexts (Kozel, 2008). Bolter and Gromala even propose "performance" as "an even better word than *interaction* to describe the significance of digital design in general. As users, we enter into a performative relationship with a digital design: we perform the design, as we would a musical instrument" (2003, p. 147).

Interactivity and Narrative

There is an area of overlap between approaches to interactivity in video game studies and in the field of interactive fiction (also called IF, hypertext, or interactive narrative). Regardless of whether interactivity and narrative are antithetical or can co-exist (a question played out in the ludology vs. narratology debates in video game studies), to read or watch a narrative unfold without having any interaction with it other than interpretive is not the same as playing a game. As Michael Mateas and Andrew Stern contend, and attempt to transcend in their formulation of interactive drama:

> The ephemeral quality of gameplay, the experience of manipulating elements within a responsive, rule-driven world, is still the raison d'être of games, perhaps the primary phenomenological feature that uniquely identifies the computer game as a medium. Where gameplay is all about interactivity, narrative is all about predestination. There is a pervasive feeling in the game design community that narrative and interactivity are antithetical.
>
> (2000, p. 643)

In the narratology vs. ludology debates, some would seek to categorize video games as a kind of interactive narrative; others view interactivity and narrative as mutually exclusive, if they align narrative with fixed and predetermined. However, narrative as defined by restrictions and choice is not the only lens through which to explore the relationships between interactivity and narrative, as Michael Nitsche (2008) deftly demonstrates with his focus on 3-D space in video games and virtual worlds, and a result ant shift from narrative to narrating, a "distinction between event and telling of event in video games. Often the player might control the actions but their presentation is defined by the game system" (2008, p. 55). Subtle understanding of story and telling in games, of how players perceive their experiences in that context, provides insight into how interactivity occurs not "in" a computer system, from the perception of the player, but "in" video game space and events. When sound, image, and action are considered together, as Karen Collins does (2013), "interactivity is both a physical and psychological engagement with media" (p. 15) that is "multimodal" (p. 22).

It is the quality of the experience rather than the specific features or kinds of choices that creates the "thresholdy" feeling of interactivity. How choices shape the experience of interactivity in interactive fiction, interactive drama, or video games as interactions between humans and computer systems become increasingly sophisticated, it becomes more and more difficult to ascertain whether one is choosing among a fixed set of choices or generating one's own elements. If we recall Lippman's corollary of the impression of an infinite database, we see that the perception of unlimited possibility is more important than the actual number of choices, or of knowing the number of choices.

Video game critic and game designer Ian Bogost's point that the quality of interactivity within a representation abstracts rather than simulates reality (2007) can lead us to consider an important distinction between interactivity in video games and agency. A player does not need to experience the kind of agency that matters in reality, the ability to enact change in one's situation, because he or she is engaging in play within an abstracted representation. Interactivity in a video game, which is necessarily constrained by the system even if there is the perception of an infinite database and limited look-ahead (and perhaps other of Lippman's more conversationally-oriented corollaries such as interruptibility, graceful degradation, and not losing the thread).

Importance for Video Game Studies

There are two aspects of interactivity that are most important for video game studies: (1) interactivity may be the element of video games that best distinguishes them from other media and cultural forms (such as visual art, cinema, literature, database); and (2) the quality of interactivity in a game may be a way of identifying genres of video games. First, interactivity, as Chris Crawford has argued, is a particular affordance of computers. In particular, it is essential for video games because, no matter how one defines interactivity beyond the systems approach, if someone does not act on and with the system, they are not playing a video game, but are doing something else. Although some argue that all cultural objects are interactive, such as when Lev Manovich writes, "All classical, and even more so modern, art is 'interactive' in a number of ways. Ellipses in literary narration, missing details of objects in visual art, and other representational 'shortcuts' require the user to fill in missing information" (2001, p. 56), interpretations and meaning-making do not change the object itself, or participate in the ordering or other choices of experiencing it in a way that is manifested. Moreover, there is not the reciprocal exchange of information between a reader and his or her book, for example, or a spectator and the film s/he is watching, that there is between a gamer and game. Although the kind of input may differ (joystick, mouse, keyboard, kinetic, haptic, voice), as well as the platform and content, it is the specifically "ergodic" nature of the action of interaction, the combination of physical, intentional, and responsive activity of interactivity that makes interactivity particularly important for video games. Although new media forms other than games can also have the property of interactivity as defined here, interactivity is a defining aspect of video games.

Second, the kind of interactivity, when interactivity encompasses gameplay, may be used in video game studies to categorize video games into genres. Mark J. P. Wolf argues:

> While the ideas of iconography and theme may be appropriate tools for analyzing Hollywood films as well as many video games, another area, interactivity, is an essential part of every game's structure and a more appropriate way of examining and defining video game genres.
>
> (2001, p. 114)

For Wolf, interactivity is gameplay, and along with motivation and goal, can be used to categorize video games in the most meaningful way. Although the genres themselves provoked debate, the principle of categorizing video games by interactivity was not substantially challenged. In practical terms, interactivity in video games is what a player can do in them—the choices and action that comprise gameplay.

As those in video game studies seek to delineate and understand what is meaningful and unique about video games, and as video game designers continue to create new experiences for gamers, they find new ways of exploring the meanings of interactivity. Bogost's relevant interaction, Salen and Zimmerman's meaningful play, Laurel's threshold, Nitsche's idea of how game spaces induce narratives—all of these are harder to pin down than a feedback loop in a system, but they point to interactions that engage emotionally, psychologically, and kinetically.

When considering interactivity as a perception of the user, the illusion or experience of participation takes precedence over systems-based definitions of interaction. As one extension of this line of inquiry, Sherry Turkle's discussion of "relational artifacts" such as robot pets, that "present themselves as sentient and feeling creatures, ready for relationship" raises questions about what emotions such artifacts will evoke in their users, about "what loving will come to mean," how it will "affect people's way of thinking about what, if anything, makes people special?" (Turkle, 2005, quoted in Seifert et al., 2008, p. 18).

Questions about interactivity like the one Turkle asks lead to explorations of the broadest issues, such as whether the feeling of reciprocity possible in human-to-computer, or ergodic interactivity can ultimately provide a deep acknowledgement of being-in-the-world for the user, of what, using Bolter and Gromala's term, the *performance* of interactive experience has and could entail in the future. Whether from a theoretical, ludic, or game design perspective, it makes sense to think about interactivity in video games from the user's perspective, as experience, or the potential for experience, and to pay increasing attention to perceived interactivity rather than hunting for technical definitions to describe a phenomenon essential to the enjoyment of video game play and meaning.

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23
LUDOLOGY
Espen Aarseth

Ludology has been erroneously contrasted with narratology (narrative theory), but since the "ludologists" all used narrative theory in their approaches to games, this juxtaposition is misinformed and does not bear critical examination. The cause of this misunderstanding is the ludological critique of naive and untheoretical applications of narratology to games (and certainly not narratology as such) that were prevalent in the early years of game studies.

In what sense can ludology be said to exist? Since the main historical agents associated with the term do not really make elaborate claims for what it is, it has been mostly up to others, often adverse to what they intuit that ludology may be, to categorize and define the term. This is, of course, not easy since they have had little to work with, and, lacking sympathy, often produce unintentional caricatures and simplifications, and tend to misrepresent the ludologists' actual views.

Ludology is an ambiguous term in game studies and game research in general. It can refer to (1) the study of games in general, or (2) to a particular approach to game research, or (3) to a movement active in the years 1998–2001. The term was introduced to computer game studies by Gonzalo Frasca (1999) as a proposal for a new methodological approach needed to make sense of games and game structures, as a clear parallel or sister discipline to narratology as the structural study of narratives. The context for this proposal was the very preliminary stage of game studies before the turn of the millennium. At that time, at the height of the academic digital media obsession of the 1990s, humanities researchers from film, media, and literary studies with an interest in games reached a critical mass and formed international networks, often recruited from already-existing new fields such as hypertext and virtual reality studies.

A focal moment for ludology was the first Digital Games and Culture (DAC) conference organized by the Department of Humanistic Informatics at the University of Bergen in 1998. This conference collected all the major names associated with the ludology label, including Markku Eskelinen, Gonzalo Frasca, and Jesper Juul. The conference also saw the beginnings of a debate concerning the narrative status of computer games, with papers such as Juul's clearly at odds with several narrative approaches to games. The debate also played itself out at following iterations of the DAC conferences, especially in Atlanta in 1999, and at Brown University in May 2001. Gonzalo Frasca (2001), starting his seminal ludology.org blog, writes in one of the first entries of his experience at DAC 2001: "I gave a talk on videogames, in the 'play' panel, along with Markku Eskelinen and Jesper Juul. Interestingly, the three of us were baptized as the 'ludologists', some kind of new sect on videogame theory."

That year also saw the first international game-focused humanities conference, at the IT

University of Copenhagen in March 2001, and another one in Bristol in June, at the University of the West of England. Henry Jenkins, a participant in the Bristol conference, later commented:

> At a recent academic Games Studies conference, for example, a blood feud threatened to erupt between the self-proclaimed Ludologists, who wanted to see the focus shift onto the mechanics of game play, and the Narratologists, who were interested in studying games alongside other storytelling media.
>
> (Jenkins, 2001, p. 118)

This text appears to be the first where "Ludologists" were pitted against "Narratologists"—a dichotomy not found in any of the relevant writings or blog entries until then.

Of the most visible "ludologists," only Frasca attempts to fill the term ludology with meaning, while Juul (2000) simply asks, "We need a ludology, but what ludology?" As conceived by Frasca, ludology was meant to do for games what narratology does for narratives, and he did not promote any particularly critical views of the latter, merely that ludology should be an independent and necessary approach that would form the methodological basis for game research: "Our intention is not to replace the narratologic approach, but to complement it" (Frasca, 1999). But Frasca also did not specify or outline the paradigmatic aspects of ludology, and neither did anyone else. Instead, what have been associated with this somewhat vacuous label are three critical interventions directed at contemporary approaches to games. (Additionally, there have been a number of attempted framings of ludology that were not grounded in actual positions held by "ludologists," but such fluff will not be addressed here.) These three interventions are quite different, a fact that remains unnoticed by ludology's innumerable commentators. The first two are both related to the question of stories and games, but one concerns criticism, and the other theory. The critical question concerns the viability of storytelling via games and game software, and is a normative, art-critical approach, while the theoretical issue concerns the applicability of narratological terminology and concepts to game phenomena, and is a methodological, theory-critical approach. The third intervention is a general position not specifically concerned with games vs. stories or narrative theory, but one that questions the hermeneutic link between mimetic and mechanical aspects in gameplay.

In addition, ludology has been associated with the institutional position of academic autonomy for the field of game studies (e.g. by Bogost, 2006): "the strong position that the study of games necessarily requires an autonomous terrain completely separate from other fields" (p. 172). But Bogost's critique of this "separatism" conflates two very different levels of academic infrastructure: a separate discipline or singular methodology of game research, and an independent department of game research. A separate department, politically autonomous in relation to other university departments, should and can harbor a number of co-existing disciplines (but usually trained in some thematically uniting phenomenon, e.g. English) whereas a separate discipline is of course a much more narrow and exclusionary project. In game studies, as the name itself implies, a monolithic discipline is both unrealistic and irrelevant as a strategy, since the object of study is not one but *legio*: games as aesthetic objects/texts, games as social process/ritual, games as technological/designed systems, etc. All these require different methodologies from different disciplines that, when institutionally combined, can benefit from each other's insights. Such institutional progress is, of course, met with resistance from existing departmental structures, as well as from those who, entrenched in these existing structures, would prefer to see game studies as a breathing hole free from the institutional conflicts and pressures of their academic everyday life. Insofar as the banner of ludology has been associated with this move of institutional/departmental autonomy, it is inevitably resisted by those who continue to stake their academic future on an older department, be it English, Sociology, or Media Studies.

The original meaning of ludology, proposed by Frasca, as simply the study of games, has seen very little use within the field of game studies, probably for two very different reasons. First, the polarized meaning soon began to dominate, and second, a specific term intended to envision the field as a new and singular discipline held little appeal in a field so multifarious.

Normative Ludology-as-Criticism

Critical ludology is an approach to video games that is skeptical of the attempted marriages between game design and storytelling. There are (at least) two varieties hereof: strongly critical ludology, which states that "the computer game is simply not a narrative medium" (Juul, 1999, p. 1) and moderate critical ludology, which believes that "games seldom, if at all, contain good stories" (Aarseth, 2004). While the strong version rejected the possibility of a successful merger between games and stories (a position from which Juul later would retreat), the moderate version merely pointed to the (at the time) weak and problematic results, which had frustrated both players and designers (such as *Myst* (Cyan, 1993) creator Robyn Miller), and did not exclude the possibility that this eventually would change: "Perhaps more complex works yet to come will have solved the aesthetic problems of games trying to be narratives and narratives trying to be games" (Aarseth, 1999, p. 35). Another variety of critical ludology can be seen in Markku Eskelinen's reaction to invocations of Aristotelian drama theory and the aesthetics of Victorian novels found in Laurel (1991), and Murray (1997): "it's an attempt to skip the 20th century altogether and avoid any intellectual contact with it, a consumerist double assassination of both the avant-garde and advanced theory" (Eskelinen, 2001). In other words, combining literary aesthetics with game technology is not necessarily a bad idea (Eskelinen is himself a literary author interested in the experimental potential of games), but applying "outdated" models is. In Eskelinen's critique we can hear clear echoes of the Frankfurt School's critique of kitsch.

Ludology as Methodological Critique

Another important critique associated with ludology, leveled not at games or game designers but at academic attempts to theorize games, is what has been misconceived as ludology's apparent rejection of narratology as applied to games. This, perhaps the strongest popular (but unfounded) belief about ludology, should be contrasted to the fact that all the central "ludologists," Frasca, Juul, and Eskelinen, are trained in the study of narrative, and all apply narratology to games in their own work. They are, both professionally and in effect, narratologists, and thus in a position to critique (and reject) weak applications of narrative concepts and models to games. What better way to understand how games and stories relate than through the use of narratology? In this light, the mythological opposition between "ludologists" and "narratologists" is revealed as a falsely constructed conflict that cannot be confirmed by diligent investigations of the "ludologist" literature. This was already pointed out by Frasca (2003), and has been discussed in great detail by Eskelinen (2012, see also Aarseth, forthcoming).

Ludo-Hermeneutics

Olli Leino (2010) has suggested that Gadamer ([1960] 1989) was the first ludologist,

> in that he was more interested in "games themselves" than in the players, [and] suggests that the playing of a game is a way for "an activity to become a work" and thus gain independence from the subjects engaged in it.
>
> (2010, p. 79)

Gadamer saw games as processes where the subjectivity of the player was sidelined by the subject of the game itself, and thus a condition where players are not free to make sense of the game as though it is a code independent of the player. Whether Gadamer is right or not, he is close to the position in game studies where the relationship between player and game is defined by the gameplay and mechanics, and only intermittently by the player's observations of the mimetic, representational aspects of the game. This position has sometimes been construed as a focus on the formal aspects of play, but it would be more accurate to see it as an emphasis on the player as a part of the game system, an agent partly definable by the role the game affords, and as a condition framed by the game's affordances and therefore as an integrated part of the game. In this view, the semiotic content and audiovisual aspects function not primarily as representations of an external (actual or fictional) world, but as mnemonic mediators between the game's mechanical system and the player. This position, while contested, offers explanations both of the failure of most games used for learning purposes (except those where the mechanics of the game closely match the learning domain) and also for the missing empirical evidence for a causal link between game violence and increased violent behavior in heavy users of violent games. In short, the game's "skin" or representational layer is interchangeable and therefore often inconsequential for the seasoned gamer, just as the scenery along an oft-traveled road becomes all but invisible for the frequent traveler.

Ludo-hermeneutics is seemingly at odds with the idea that games can convey messages and ideologies, and has therefore garnered protests from researchers who believe in the ideological, rhetorical, or pedagogical potential of games. At the same time, it is an effective argument, supported by the lack of evidence, despite decades of research, for the non-issue of increased violence as a consequence of violent gameplay. This lack of positive findings both for games as efficient learning tools (see Egenfeldt-Nielsen, 2005) and violent games as inducers of violence seems to suggest that the "ludological" position of autonomy aesthetics, that is, that the hermeneutic decoupling of gameplay from the referential and contextual aspects of the game, is a tenable position. But it is also one that cannot be resolved completely without clinical experiments aimed at mapping the players' perception and cognition.

Conclusion: What Is Ludology?

Ludology is not a discipline. It is not even a paradigm, but mostly a reaction to bad scholarship and a critique of untenable positions, as well as a critical response to the aesthetic problems of game/narrative hybrids of the 1990s. As the former, it is still relevant (and simply scholarly diligence in practice), but as the latter it has been overtaken by the game designers' considerable ludo-narrative advances over the last decade. As for ludo-hermeneutics, it is in its early days yet, and much work remains to be done.

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24

OBJECTIVES

Louis-Martin Guay

Playing a game always involves achieving some objectives. These can be divided into three types: formal objectives, learning objectives and experiential objectives. This tripartite classification can help designers and researchers see objectives in most games as part of a complex system that defines the player experience. First, I will discuss the difference between terms such as “objectives” and “goals,” then describe what an objective can be, and finally I will propose an overview of the definition and classification of those objectives in video games. The formal/learning/experiential repartition of objectives can lead to further research in the following of the Mechanics–Dynamics–Aesthetics (MDA)-type of applicable concepts for designers and scholars (MDA is a concept that Hunicke, Leblanc, and Zubec proposed in 2004). As Ian Schreiber write in his blog Game Design Concept:

> The game designer only creates the Mechanics directly. The Dynamics emerge from the Mechanics, and the Aesthetics arise out of the Dynamics. The game designer may want to design the play experience, or at least that may be the ultimate goal the designer has in mind … but as designers, we are stuck building the rules of the game and hoping that the desired experience emerges from our rules.
>
> (Schreiber, 2009)

Defining Objectives and Goals

There’s a blur around the term “objective” in the video game’s common terminology because of the omnipresence of another unavoidable word: goal. The two are synonymous in most dictionaries and literature. The *Oxford English Dictionary* even defines an objective as: “A thing aimed at or sought; a goal.” It seems that every time we find the word “objective” in any designer’s or scholar’s book or paper, the term “goal” is not far behind. The word “objective” refers to something, often quantifiable, that has to be achieved. Objectives frequently are a projection of the possible or desired outcomes. In game theory, on the one hand, we could observe a constant use of the term to define an unknown outcome or result. On the other hand, the word “goal” is often use to qualify an unquantifiable outcome, a global target, or a purpose. Some veteran designers such as Andrew Rollins help us better understand the distinction by writing: “Often a game has not only a primary objective but also secondary aims that have to be attended to before you can reach the final goal” (Rollins & Adams, 2003, p. 55). From this quote, we understand that, in *Super Mario Bros*. (Nintendo, 1985), saving the princess is the goal, passing through the level is an objective and accumulating coins is a secondary aim. Since the concepts of objective and goals are so closely related in the writings of many scholars and patricians, I will use “objective” instead of goal, in the following text.

To Design Objectives, We Must First Understand Them

Most games need to be learned. This is why rules, tutorials, feedbacks, controls, and rewards are so important. New fields of interest in game design and game studies—including gamification, ludicity, instructional design, and ethical design—rely on the concept of objectives because the experience of a game is lived by the player through her or his understanding of the main goal of that game. In “Understanding Digital Playability,” Sébastien Genvo summarizes D. W. Winnicott’s idea that any kind of play is driven by a goal:

> For D. W. Winnicott, playing is a process in the sense that “playing is doing” and that doing is proceeding. This means that any activity which requires a form of play usually implies a goal. While there are forms of play without a definitive goal, there is almost always some kind of objective in the actions undertaken during play. Likewise, there are forms of play without a final sanction which would put an end to the activity, from which a result would be drawn (a loser/a winner, the realization of a performance in a given time, etc.)
>
> (Genvo, 2009, p. 135)

Some games objectives are simple and targeted on a single task such as shooting, running, or jumping, as was the case in many early arcade games. For those games, it was easy for the designers/engineers to concentrate their efforts on the technological challenge. No one was confused by the objectives of *PONG* (Atari, 1972), which were: deflect the ball with the paddle, and score more points than your opponent. However, at the dawn of the twenty-first century, the evolution of technology and the complexity of games caused some designers to juggle with multi-objectives games, in which mixed strategies have to be used, leading to outcomes that are neither simple nor clear. For multi-objectives games, sometimes no optimal solution exists; players have to look for the best solutions, the ones that satisfy the most criteria. In looking for this specific answer, players may find multiple “best” solutions (*Triadic Game Design*, Hartveld, 2011). The era when the player’s objective was only “to move to the right” in a platformer game is gone. Complex games such as *Grand Theft Auto 4* (Rockstar, 2008), *Sankogushi 12* (Koei, 2012), or *EVE Online* (CCP Games, 2003) require a systemic approach to design. To approach the concept of “objectives” with such a systemic point of view, it is useful to have a deeper understanding of the topic.

When one designs a game or any kind of artifact, it is critical to define objectives (see Dirksen, 2012). An objective’s definition is part of the design process and constitutes one of the best-known techniques of starting a project. A systematic approach provides coherence in the process of designing games for hypothetical players. Inspired by this comprehensive frame, we can identify sets of objectives that match each of these three phases, resulting in formal objectives, learning objectives, and experiential objectives. Even though much design research is made on a uni-disciplinary level, everyone implicated in the design process needs to consider the “base mechanisms of game systems, the overarching design goals, or the desired experiential results of gameplay" (Hunicke et al., 2004). This tripartite classification could help designers and researchers see objectives in most games as part of a complex system that defines the player experience.

Formal Objectives

Games are formal systems. As such, they are intrinsically made of formal objectives. In a game such as *Pac-Man* (Namco, 1980), you know that you have to pass through the level by avoiding the ghosts (formal objective) before knowing how to do it (learning objective). The player knows that she or he need to eat dots to make points in the process of gaining an extra life (formal objective) before experiencing the fun and the accomplishment of gaining such a thing (experiential objective). In the process of play, the player will stretch her or his understanding of what needs to be done to be on the top of the high-scores list.

The formal objectives of a game are created by the act of design. Formal objectives are the frame of a game. This is probably why veteran designers such as Rollins (Rollins & Adams, 2003), Fullerton (2004), or Crawford (1982) insist so much on the establishment of game's goal as the first step of any game design. In *Triadic Game Design*, Casper Hartveld summarizes Chris Crawford's idea:

> According to game designer Crawford (1982) the first and foremost question a designer has to answer is "What does the player do?" In determining this, it is important to clarify the goal of the game. A goal is an explicit or implicit statement at the beginning of the game that explains what the player needs to do. It defines the sort of objectives, like saving the princess or planet Earth that players need to achieve to reach the desired end-state. If players achieve the goal(s), they succeed. Otherwise they fail.
>
> (Hartveld, 2011, p. 178)

Fullerton adds to this point by saying: "In games, however, the objective is a key element without which the experience loses much of its structure, and our need to work towards the objective is a measure of our involvement in the game" (2004, p. 29).

In *Half-Real: Video Games between Real Rules and Fictional Worlds* (2005), Juul supports the idea by saying that games without clear objectives are less game-like than others. Adopting this point of view, we can say that games such as *Peggles* (Pop Cap, 2010) are more formal-objective-based than games such as *Facade* (Procedural Arts, 2005). But can we say that the more formal objectives there are in a game, the more it could become limited and predictable? Certainly if a player wants to "beat the game," she or he will need to have clear understanding of goals and victory conditions. A definitive end state will have to be created to obtain a satisfying outcome. Ralph Koster believes that "the more formally constructed your game is, the more limited it will be" (2005, p. 38). As he suggests, if we want more long-lasting games we must introduce some variables such as human psychology, physics, and so on. This is why complex games cannot rely only on formal objectives. Few examples in the history of games suggest the contrary, with the exception of ancestral masterpieces such as chess and Go. Even *Tetris* (Alexey Pajitnov, 1985) can become boring by its lack of adjustable difficulty, which causes an imbalance in the flow of the game.

Working on a taxonomy of formal objectives, Tracy Fullerton, in her book about game design (2004), presents an interesting summary. She writes that six categories of objectives are regularly used in games:

> Capturing: Capture X and/or avoiding to be captured by X.
> Chase: Catch X and/or elude X.
> Race: Reach Y before X.
> Alignment: Arrange your game pieces in a certain spatial configuration.
> Rescue or escape: Get a defined unit or units to safety.
> Forbidden act: Get the competition to "break the rules" by doing something they shouldn't.
>
> (2004, pp. 60–63)

These categories are not exhaustive, but are used here to exemplify what a formal objective could be in a video game.

Because they exist to create challenge, conflict, and learning, formal objectives can be more important for the designer than for the player. If the player is committed to the game, if she or he is immersed in the fictional world, if a certain level of flow is attained, then the player could easily forget the formal objectives. The learning and experiential objectives will sustain the player's experience and enjoyment, supporting the challenges and conflicts she or he will overcome, as the structural frame of the game becomes transparent and her or his attention is focused on short-term fulfillment. To maintain the player's interest on the short term, the player must progress and learn new skills. For each challenge, a learning objective must be designed.

Learning Objectives

When you design a learning experience for the user, you want to determine a path for her or him to follow. First, you identify the problem that will need to be solved; second, you set a destination to be attained; then you determine the gaps between the starting point and the destination, and finally, you decide how far she or he will be able to go (see for instance Dirksen, 2012). Solving the problem is the player's objective, which can be a task such as killing all enemies, capturing something, maximizing resources, beating the clock, scoring more points than your opponents, etc. The destination is the final state of the game, the moment when the player will meet the victory (or defeat) condition(s). The ultimate game goal is the victory condition (Brathwaite & Schrieber, 2008). The gap between the understanding of the initial problem to solve and the fulfilment of the final challenge is filled with all the micro-challenges and micro-objectives the designer will put on the path of the player before she or he can attain his goal. In the end, the hardest task may be choosing the means by which the player will be able to achieve those objectives. In this operation, the player will develop new skills, master new abilities, and develop her or his own meaning of the game. The learning objectives are those that will help the player interact with the game, develop and master skills, and construct her or his cognitive comprehension. They will support the process described by Polya (1945) who considers that "we go through four phases: (1) understanding the problem, (2) generating one or more hypotheses, (3) testing hypotheses, and (4) checking the result" (Gafurov & Wang, 2003, p. 3). When the player knows that the ghosts must be avoided in *Pac-Man*, the designer must show her or him how to do it. If the formal objectives refer to the first phase of Polya's process, the learning objectives are more active in the second and third phases. The fourth phase will be linked with learning because of the feedback the system will provide the player, but we can expect a constant presence of experiential objectives.

Learning objectives determine the form of gameplay, as long as they are designed first. We think about how the player will kill the zombie, before choosing how many zombies must be blown away to pass the level. Reflecting back on Koster's ideas regarding formality, we could use learning objectives to reduce or remove the feeling of limitations set by an overload of formal objectives. Those objectives also play a major part in the player's engagement in the game because they will provide the potential flow of the game loop. A game loop consists of one objective, one challenge, and one reward; designers refer to this as OCR. The concept represents the vast majority of playing time in classic video games. The variation between abilities and challenges depends on well-designed learning objectives. If we accept the ideas of flow (Csikszentmihalyi, 1990) or challenge-based immersion (Ermi & Mäyrä, 2005), we can observe that they are constructed on learning objectives. In this process, the player learns, according to Gee (2008), a new literacy, possibly attaining what Calleja's Digital Game Experience Model (DGEM) describes as a "micro-involvement" based on "the moment by moment instance of the game-play instance" (2007, p. 237). In fact, learning objectives can control this "micro-involvement" by regulating challenges through the game with well-balanced OCR game loops. All of this is in relation to the construction of the path for the player; the micro-challenge and micro-objectives must respect the learning phases of Polya so as to encourage the "micro-involvement" of the player, which can create a challenge-based immersion.

Experiential Objectives

In the mind of a designer, the experiential objectives are the hypothetical ones. They are supported by the two first types of objectives, but they depend on a much more subjective issue: the player experience. Therefore, experiential objectives are based on expectations. With a systemic approach, and a lot of play-testing and experience, a game designer can considerably increase her or his chance of connecting with the player. This approach is not an exact science, the notion of player experience is still in construction, and the intuition of the designer is often used in the design of experiential objectives.

The most important consideration, however, is that despite all the efforts a designer puts into the design of a player experience, players can have completely different experiences from the same game. In most games constructed mainly with formal objectives, the design can more straightforwardly bring the player to the intended experience. For example, in *Pac-Man*, there isn't a lot you can do besides eating dots and getting away from ghosts. Players could step outside the formal experience by organizing a tournament and crowning a world champion, but even the meta-game remains shallow. We can imagine the difference between *Pac-Man* and any kind of MMOG (massively multiplayer online game) or adventure games such as *Grand Theft Auto 4* (2008) or *Diablo 3* (Blizzard Entertainment, 2012). Experiential objectives must be seen as objectives in constant evolution, they are conceived to be permanently open. The most common objective found in of games is to have fun when we play them. There's no limit to the idea of having fun, no definitive theory, and we desperately need a satisfying definition. Because we cannot describe "fun" very well, the debate shifts to how we can make a fun game. At this point, the main objective is often split into a lot of "micro-objectives" made to solve a bigger problem. The fun will be spawned from the sum of those parts. Some designers and researchers have tried to respond to many things concerning experiential objectives including emotion, feedback, and inputs, culture, and much more.

In "Principles of Virtual Sensation" (2006), Steve Swink proposes some good ideas on the ambiguities of inputs. His thoughts revolve around the interaction between the player and the computer and how this must be "felt." He proposes that "[t]his 'virtual sensation' is in many ways the essence of videogames, one of the most compelling, captivating, and interesting emergent properties of human-computer interaction" (Swink, 2006, p. 1). Swink proposes seven principles (2006, p. 3):

1 Predictable results—Allowing a sense of mastery and control by correctly interpreting player input and providing consistent, predictable results.
2 Novelty—There is an infinite number of results from the same input.
3 Good feedback—Enabling mastery, control, and learning by rewarding player experimentation.
4 Low skill floor, high skill ceiling—Making the mechanic intuitive but deep; it takes minutes to pick up and understand but a lifetime to master.
5 Context—Giving a mechanic meaning by providing the rules and spatial context in which it operates.
6 Impact and satisfying resolution—Defining the weight and size of objects through their interaction with each other and the environment.
7 Appealing reaction—Producing appealing reaction regardless of context or input.

Experiential objectives can be constructed around those principles. They rely on the three categories of objectives (formal, learning, and experiential) but they will be concretized by designing interesting experiential objectives. Ideas like that can help designers to organize and evaluate players' behaviors and, by the way, influence the whole experience.

Another interesting point is the influence of player culture on player experience. The only way the objectives of a game can incorporate this value is by trying to know and understand every aspect of a designated culture or subculture. For that, we can refer to the idea of "paratext" used by Mia Consalvo in *Cheating: Gaining Advantage in Videogames* (2007) where she uses Bourdieu's notion about "cultural capital," writing,

> being a member of game culture is about more than playing games or even playing them well. It's being knowledgeable about game releases and secrets, and passing that information on to others. It's having opinions about which game magazines are better and the best sites for walkthroughs on the Internet.
>
> (2007, p. 18)

Being aware of the culture surrounding a game, playing styles, or knowledge regarding the game, its genre, its inspiration, and its related artifacts, can help determine the process of designing an experience.

Finally, the player's experience will often be linked to narrative, and studies and concepts involving narrative and video games are numerous and beyond the scope of this essay. I will only discuss the concept of "narrative architecture" put forward by Jenkins in "Game Design as Narrative Architecture." Jenkins writes: "Choices about the design and organization of game spaces have narratological consequences" (2004, p. 129) and proposes four types of narratives that designers can create in games: evoked, enacted, embedded, and emergent narratives. Of the four, which could all be related to experiential objectives, the most interesting seems to be the last one. Emergent narratives rely partially on the designer's decisions. For an emergent narrative to appear the designer must be akin to a musical conductor or an architect, she or he can lead parts but doesn't play them, and can sign the plans but cannot build the house. The designer sets the ground for the narrative to be played out, but the player actually constructs it by playing the game.

In retrospect, we cannot count on science, at least for the moment, to provide us appropriate guidance and we need a deeper understanding of players (Ernest Adams referred to "player's empathy" in a lecture at the 2010 Game Developers Conference) and players' participation. Therefore, the design of experiential objectives is the hardest, most ill-defined part of the designer's job.

Conclusion

In this essay, I have suggested that objectives can be structured in a tripartite organization to help describe the impact of each designed objective of a game. If we suppose that each objective has an impact on the whole experience of playing a game, a deeper understanding of their nature and mechanism could be helpful. The formal/learning/experiential repartition of objectives can lead to further research in the following of MDA concepts. By designing better objectives, we will have better games to play.

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25

PLAYERS/GAMERS

Frédéric Clément

While *play* and *game* are words that orbit the same semantic fields (amusement, entertainment, sports, etc.), *a game* is not *a play*, and *playing* is not the same as *gaming*. Correspondingly, a *player* might not be the same person as a *gamer*. But what differentiates these types of video game users, and what are the borderline cases that exist between—and at the periphery of—the two? This essay explores multiple approaches toward *game* and *play* in an effort to more clearly highlight the differences between categories of the video game users.

Origins

Any attempt to better differentiate, and then categorize, players and gamers must inevitably start with an examination of the terms in English (for a study of play-related terms in many languages, see Johan Huizinga's second chapter of his book *Homo Ludens: A Study of the Play-Element in Culture* ([1938] 1955), titled "The play-concept as expressed in language"). According to the *Oxford English Dictionary*, "play" finds its roots in the Old English words *pleg(i)an* (to exercise) and *plega* (brisk movement), as well as being related to the Middle Dutch *pleien* (to leap for joy, to dance). Play is part of many semantic fields revolving more or less closely around the ideas of entertainment, pleasure, and joy: "to play a role," "to play an instrument," "to play sports," "to play on words," etc. And, according to the *Oxford English Dictionary*, "game" is derived from the Old English *gamen* (amusement, fun) and *gamenian* (to play, to amuse oneself), which are words of Germanic origin that, like play, are usually correlated with entertainment. While *playing* is related to most amusement-related activities, *gaming* has a somewhat narrower applicability, being mostly used to denote playing board games (which have existed since at least the days of ancient Egypt), and a more recently-devised activity: taking part in pen-and-paper role-playing games such as *Dungeons & Dragons* (TSR, 1974) (while pen-and-paper role-playing games can be considered "board games," the board's main use here is to enhance the gaming experience and is, in many cases, optional). Likewise, while *a player* is the person partaking in recreational diversions in a general sense, *a gamer* is more specifically a player of board games and pen-and-paper role-playing games, or, more recently (and, perhaps, more prominently), a player of *video* games.

Thus, it seems that words associated with "game" (such as *gaming* and *gamer*) are closer to our object of interest than, say, those associated with "play" (such as *playing* and *player*), which covers a broader semantic range. Still, reflecting on "play" rather than "game" has been the driving force behind the theorists that preceded video game scholars, and it behooves us to refer to the work of three great pre-video game thinkers before getting to the players and the gamers themselves.

Three Ways of Thinking about Play before Video Games

Even though the first three authors discussed below display more interest in *playing* and *games* than in *players* and *gamers*, their approaches provided essential intellectual ground for video games scholars when the field was defining itself. A brief summary of their thoughts is therefore in order.

In the opening chapter of his book *Homo Ludens*, first published in 1938, Dutch historian Johan Huizinga ([1938] 1955) mentions that other scholars preceded him in the attempt to define "play," but that they limited their analysis of it as a biological function. Huizinga instead goes for a more Platonic approach, bringing up the aesthetic and cultural qualities of play and treating it as a fundamental human function. For Huizinga, play is irrational, different from ordinary life, opposed to seriousness, uncertain, secluded in space, and limited in time; but above all, play is a voluntary and free activity. Huizinga's *homo ludens* is also, by definition, a *homo liber*—a free man. Huizinga identifies a few forms of play in his writings: play as the activity of the sportsman, of the actor, of the musician, and even of the priest, each being a "player" in their own way. He mentions two problematic types of players: the cheaters (the ones who are only pretending to play the game), and the spoil-sports (the ones who ignore the rules or choose to go against them). Despite his descriptive work, Huizinga doesn't propose a classification or a categorization of the forms of play. A suggestion for this much-needed schema would come from a rereading of Huizinga by Roger Caillois, a French author and philosopher.

In his book *Man, Play and Games*, first published in 1958, Caillois (2006), like Huizinga before him, insists on the freedom of the player to play the game, noting that this freedom must be a characteristic situated above all else for the game to be considered a game, adding that the player must be able to leave the game at any time. Caillois proposes a model for sorting the forms of games. In this model, we first find a continuum that ranges between two poles, the pole of the *ludus*, associated with the competition and the respect of the rules, and the pole of the *paidia*, associated with a certain willingness to create disorder, and even perhaps a certain level of playful destruction. Caillois also proposes four categories to better characterize types of games, a classification based on the activity that is dominant in any given game: competition (*agôn*), chance (*alea*), simulation (*mimicry*), or vertigo (*ilinx*). Caillois highlights striking oppositions between some of those categories, most notably related to the *attitude* that Caillois ascribes to players of *agôn* games on one hand, and of *alea* games on the other. The necessary attitudes for those two types of games are opposites, *agôn* being "a vindication of personal responsibility," while *alea* is not only "a negation of the will," but also "a surrender to destiny" (pp. 133–134). Caillois thus attributes a passive attitude to players of games of chance, and an active attitude to players of competitive games. Also, just as Huizinga did, Caillois addresses the spoil-sports (whom he describes as nihilists) and the cheaters, two particularly problematic types of players who resist his taxonomical efforts.

A third study must be addressed before broaching the subject of the player and the gamer: Bernard Suits's book titled *The Grasshopper: Games, Life and Utopia* (1978). In the course of his research on the necessary characteristics of what a game is and isn't (a process driven by a dialectical and almost pedagogical approach), Suits identifies four essential elements that characterize a game. Considered together, these four elements mean that to play a game is

> to attempt to achieve a specific state of affairs [what Suits calls the *prelusory* goal], using only means permitted by rules [called the *lusory means*], where the rules prohibit use of more efficient means in favor of less efficient ones [those rules are known as the *constitutive rules*], and where the rules are accepted just because they make possible such activity [the state of mind necessary for the player to accept such conditions is designated as the *lusory attitude*].
>
> (2006, p. 190)

Suits also provides his own pocket-sized version of his definition: "playing a game is the voluntary attempt to overcome unnecessary obstacles" (p. 190). The four elements mentioned are essential for "game playing" to occur, but Suits assigns a predominant role to the lusory attitude, for it is what links the goals, the means, and the rules together. Still, Suits identifies a kind of overarching meta-element that surpasses all others: the players must always be able to quit the game as they see fit. For Suits, just as with Huizinga and Caillois before him, the fundamental property of play is the freedom of the player.

Now that play, its attributes, and its characteristics have been covered, it is time to focus on the users, on the people who are engaged in the playing activity—but are these people *players*, or are they rather best described as *gamers?*

From Player to Gamer to Gameplayer

In 2003, Bernard Perron proposed a distinction between the *player*, which was (and still is) a widely used term to describe the person engaged in any kind of play activities (sports, music, video games, etc.), and the *gamer*, a term mostly promoted by the video game industry to label its own adepts. Then, Perron goes even further in his distinctions by coining the term *gameplayer*.

In his rereading of Caillois's attitude, Perron associates the *player* with the *paidia* pole of the *ludus–paidia* continuum. The player has the attitude of an improviser taking decisions in complete impunity. He or she is more likely to enjoy video games that don't fundamentally have clear objectives, such as *The Sims* (Maxis, 2000). Suits would probably say that the player isn't necessarily attracted to games that ask of the user to achieve a *specific* state of affairs. The player is also the one who yearns for the exhilaration and the controlled chaos found in video games—this yearning that translates as the abandonment or suspension of respect for the objectives dictated by the game. For example, playing a gangster-themed open-world game such as *Grand Theft Auto III* (DMA Design and Rockstar Vienna, 2001) "as a player" would mean exploring the city in a stolen car, purely for the sake of the enjoyment derived from this (whether the process involves running over pedestrians or not).

The *gamer*, meanwhile, is more closely linked to the *ludus* pole of the continuum: the gamer "goes for the challenge" (p. 244) and *desires to win the game* by achieving the goals and objectives decreed by the game. Playing *Grand Theft Auto III* "as a gamer" would involve trying to fulfill the objectives that the game specifically imposes, from destroying nine espresso stands (part of the “Espresso-2-Go!” mission) to killing three Triad warlords (part of the “Triads and Tribulations” mission). Between the player and the gamer, it is the latter who holds the most respect for the means, goals, and rules needed to sustain the play activity. The gamer is also the one who is the most thoroughly engaged in the lusory attitude, an attitude that sustains itself on a certain dose of illusion. Just as Huizinga and Caillois before him, Perron recalls the common roots between play and illusion: “the ludic attitude implies ‘an intention of illusion’; illusion *(in-lusio)* meaning nothing less than beginning a game” (p. 241).

In contrast, while also associated with the *ludus* pole, the *gameplayer* doesn’t partake in illusion. The gameplayers of *Grand Theft Auto III* set a whole new collection of parallel goals for themselves (they mostly see the goals set by the game at best as suggestions, or at worst as obligatory hurdles to overcome before getting to more interesting challenges). While the gameplayers might assume the attitude of the cheater, they don’t intend to circumvent the rules, but rather to reappropriate them in order to face challenges that they invent for themselves. Such players are “meta-players”: people who will “literally make their own game of the game” (p. 252).

Typologies

In 1996, Richard Bartle proposed a framework for classifying players found in MUDs (multiple user domains) into four types (socializers, killers, achievers, and explorers), in what Espen Aarseth calls “a general model of human behaviour in virtual environments” and “perhaps the best analysis of players and playing we have seen so far” (2003, p. 3). While MUD games weren’t dominant at the time (and have never quite been), Bartle’s typology remains useful even in non-MUD video games, and especially in the more widespread MMORPGs (massively multiplayer online role-playing games).

Bartle first conceptualized two axes governing the styles of play, the first extending between the poles of “action” and “interaction,” and the second between “world-oriented” and “player-oriented” poles. The intersection of those two axes forms four quadrants, corresponding to four different playing styles that Bartle associates with four types of players. Though this may seem like a rather perilous approach, we will “couple” Bartle’s and Perron’s typologies—keeping in mind that Bartle’s system was developed seven years prior—in an effort to better understand both authors’ concepts:

Socializers (located in the quadrant delimited by the “player-oriented” and “interaction” poles) are those for whom the game is a social place that enables encounters. For them, gameplay is secondary and is often considered a pretext for social exchanges. Following Perron’s *gamer/player* distinction, since socializers give little importance to the goals of the game, they are mostly *players*.

Killers (in the “player-oriented” and “action” quadrant) are those who find pleasure in imposing their views on others to the point of harassment, even going as far as to kill them. While the in-game actions taken by players located in the “player-oriented” and “action” quadrant aren’t necessarily reducible to “killing” other players or to other “bad” behavior, Bartle’s typology, based on his own observations and interviews in the MUD community, labels them as “killers.” By their attitude, centered on clearly-defined goals that may or may not be those put forward by the game, they can be seen as either *gamers* or *gameplayers*.

Achievers (in the “world-oriented” and “action” quadrant) work their way through the game in order to gain power levels and accomplish the game’s objectives. For those reasons, they are mostly *gamers*, and even potential *gameplayers*, if they are looking for ways to exploit the game’s rules.

Explorers (in the “world-oriented” and “interaction” quadrant) are those who are constantly looking to discover more of what the game has to offer. If the explorers focus mostly on spatial exploration, they could be *players* or *gamers*; if they focus mostly on exploring the game’s functionalities as intended by the game designers, they are best described as *gamers*; lastly, if they explore functionalities that were not intended by the game designers (such as bugs), they are mostly *gameplayers*.

Other typologies follow Bartle’s own, often comparing themselves to it, but also sometimes criticizing it. Nevertheless, Bartle’s research is still considered pioneering work and has influenced, directly or indirectly, many scholars who have proposed their own taxonomies. For instance, in their empirical study, Schuurman et al. (2008) outlined eleven game motivations that lead to the identification of four player profiles: (1) the overall convinced gamer (“highly motivated to play video games … considers gaming as part of his or her identity”); (2) the convinced competitive gamer (“also highly motivated …[c]ompetition with others and challenging oneself are the main drivers for this cluster”); (3) the escapist gamer (“scores high on escapist motivations like being someone else, exploring new worlds and enjoying the freedom a game offers”); and (4) the pass-time [sic] gamer (“considers gaming to be a nice way to spend some time, but has no other outspoken motivations for playing video games”) (p. 49). Individuals that fit in the first two categories would be *gamers* that may occasionally be *gameplayers*, and those from the last two would most likely be *players*.

While typologies and other categorizations are mostly born from academic activities, let us not forget that the results of this classification work can be used by industry stakeholders—and even specifically commissioned by them—in order to better understand and target their user base. One such applied schema was proposed by Parks Associates (2006), a market research and consulting firm, who identified six types of players: (1) power gamers (who could be *gamers* or *gameplayers*); (2) social gamers (who “enjoy gaming as a way to interact with friends”—mostly *players*); (3) leisure gamers (who “mainly plays casual titles”—mostly *players*, though they could also be *gamers*); (4) dormant gamers (who “love gaming but spend little time because of family, work, or school”—who could be either *players*, *gamers*, or *gameplayers*); (5) incidental gamers (who “play games mainly out of boredom”—*players*); and (6) occasional gamers (who “play puzzle, word, and board games almost exclusively”—*players*).

Casual or Hardcore?

While previous codifying efforts have tried to depict the inner workings of video game users, and while each went to great lengths to suggest new, intricate, and detailed ways of thinking about video games and the people who play them, we can’t avoid addressing what may be the most common classifications of players, a dichotomy widely used by the (specialized) press and players alike: that of casual players and hardcore players. Jesper Juul (2010) aptly summarizes the stereotypical conventions associated with each kind, with such statements as “has a preference for positive and pleasant fictions” and “dislikes difficult games” to describe casual players, and “has played a large number of video games” and “will invest large amounts of time and resources toward playing video games” to qualify the hardcore players (p. 29). Still, Juul goes beyond the stereotypes and, rather than assigning positions to players on a continuum from “casual” to “hardcore,” he identifies four traits exhibited by players: fiction preference (from “Positive” to “Negative”); game knowledge (from “Low” to “High”); time investment (from “Low” to “High”); and attitude toward difficulty (from “Dislikes” to “Prefers”). Among his findings following interviews with game designers and players, Juul notes that, contrary to popular beliefs, casual players are a much more diverse crowd in terms of game knowledge and willingness to invest time in their gaming activities, and that they do enjoy games that provide a good challenge relative to their skill level.

Taking Games Seriously: From Cyber-Athletes to Game Scholars

There are three particular types of players that are difficult to fit into the categories previously discussed, but which are still important to consider: cyber-athletes, the players of serious games, and the playing analysts.

It would be inaccurate to call the participants of the first video game competitions “cyber-athletes,” but video game competitions have been promoted by the industry at least since the 1980s’ Atari-sponsored *Space Invaders Tournament*. Competitive playing enjoyed great popularity among PC users during the 1990s with first-person shooters such as *DOOM* (id Software, 1993), *DOOM II* (id Software, 1994), and *Quake* (id Software, 1996), but also real-time strategy games such as those of the *Warcraft* (Blizzard Entertainment, 1994–2002) and *StarCraft* (Blizzard Entertainment, 1998–2010) franchises played competitively over modem connections or at LAN (local area network) parties. Today, competitive gaming is a profession in some countries: in South Korea, for example, superstar gamers are treated with great respect, equal to that afforded to famous practitioners of more physical and spatial sports. Cyber-athletes resist Bartle’s taxonomy because the games they play have little or no social components (though some games are played in teams and each player can have a definite role in the competition). As for Perron’s categories, cyber-athletes certainly aren’t *players*: they are *gamers* pushed to the extremes of the definition since their only goal is to win the game. In order to achieve that goal, cyber-athletes must nonetheless display the attitude of *gameplayers*: the cyber-athletes sustain no illusion and must be able to know and understand the limits not only of the programmed rules of the game, but also of the enforced rules in the competition itself. In every aspect of their gaming activities—from training to the actual competitions—cyber-athletes have to take the game seriously (for an in-depth look into the emergence of competitive gaming, see Taylor, 2012).

The term “serious games,” which was coined by Ben Sawyer (2002, cited in Breuer & Bente, 2010), is an umbrella term that now includes political games, social games, educational games, and training games. The very use of the term “serious games” isn’t without its challenges, because different authors use it to refer only to one or two types of games along the political/social/educational/training realm of possibilities. Adding to this difficulty is the fact that linking together words such as "serious" and "games" can result, depending on what definition of those words people are operating under, in an oxymoron or a tautology (Breuer & Bente, 2010). As for educational and training game players themselves, they are placed in an empowering situation, whereby they learn skills to be used at the computer (for example, when practicing on very mundane typing games) or outside of it (for example, when being put through very specialized military training simulations). Political and social games, however, sometimes rob users of their power over the game world: by disempowering users, political and social games can better demonstrate that a real-life situation can be unwinnable. Serious games are both a growing market, and an increasingly common subject for academic research (Breuer & Bente, 2010).

Playing analysts are mostly journalists in the video game field and scholars who tackle video games for academic purposes. Espen Aarseth (2003) says of playing analysts that they aren't like other types of players, and that they challenge classic typologies because they can borrow from any roles proposed by Bartle by engaging with the games on different levels. Aarseth thus proposes seven "strata of engagement" of playing analysts to identify how "deep" their play is: superficial play, light play, partial completion, total completion, repeated play, expert play, and innovative play. These strata may look like they form a gradual curve from the *players* to the *gameplayers*, but even in a state of superficial or light play, playing analysts remain meta-players who are (somehow) conscious that they are playing a game, even going as far as monitoring themselves by recording game sessions for academic purposes or by taking notes on their playing behavior.

With the increasing diversity of video games (and of ways to engage them) also comes a diversity of ways to categorize video game users. Without trying to deprive users of the power to refer to themselves as they see fit, it is the video game scholar's responsibility to take a step back in order to see the bigger picture. Categories and typologies of video game users are abundant and come from various types of people: journalists, scholars, game designers, research firms, and, of course, players themselves. While we may not know what the future holds, it is a safe bet that new ways of playing will emerge in the coming years, and, with them, new ways of thinking about what "playing"—and "player"—mean.

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26

REPETITION

Christopher Hanson

Introduction

While any individual play session of a given game may feature particularly unique elements and moments, almost all games and the pleasures associated with their play are reliant upon the mechanic of repetition and replay. Rarely does one play a game just once, and repetition is often necessary in learning a given game. For instance, a beginning checkers player may engage in multiple contests in order to fully learn the rules and develop effective play strategies. In almost all games, a player practices his or her play through actions of repetition, both in specific drills (such as a tennis player hitting balls against a wall) and more commonly through playing and replaying the game itself. More than video games, many non-digital games such as sports or less structured games such as "tag" often offer a far greater degree of variability due to their play within the "real world" and exposure to a potentially infinite number of variables that are frequently unrepeatable; environmental factors, energy levels, and moods all may continuously shape and alter each player's game strategies and movement through the arena of play. It should be noted that some non-digital games such as chess and other tabletop games may limit these variables and can be repeatable in a manner similar to video games, as discussed below. Video games place an even greater emphasis on the function of repetition and replay than non-digital games as the player must familiarize himself/herself not only with the rules, but also with increasingly complex control and interface systems in order to master game environs, which often demand multiple navigational attempts through particularly challenging areas within the game. Torben Grodal argues that video games demonstrate an "aesthetic of repetition," wherein much like the skills that we must repeat to develop and master in everyday life (i.e. walking or riding a bike), video games demand that the player engage in "repetitive rehearsal" of the controls and game mechanics in order to master them (2003, p. 148). For example, a player of *Super Mario Bros*. (Nintendo, 1985) must learn the spatial and temporal patterns of the game in order to successfully navigate its levels and challenges. Games such as *Dance Dance Revolution* (Konami, 1998) and *Guitar Hero* (Activision, 2005) emphasize repetition as a form of mastery, rating a player's "performance" by the accuracy with which s/he is able to emulate and mimic the game's prompts; complex musical games such as *Rocksmith* (Ubisoft, 2011), in which players use real musical instruments, more closely emulate the more complex mode of repetition found in real-world mastery. Other games encourage players to re-visit and re-explore specific areas with new capabilities or powers or to replay through them in their entirety in order to fully "complete" them. Furthermore, several recent video games incorporate elements of replay in their core game mechanic by allowing the player to actively control and navigate temporal structures within the game.

Time, Repetition, and Pleasure in Video Games

The role of repetition in video games is strongly linked to that of time. As Mark J. P. Wolf reminds us: "as in the cinema, temporal structures are a central element of a video game's experience" (2001, p. 90). Jesper Juul points out that time in video games is typically chronological, which differentiates games from other narrative forms. He states: "The prevalence of unchronological time in traditional narratives is afforded by the fixed nature of events. Because the story in a sense has already happened, the events can easily be presented in nonchronological order for aesthetic effect" (2004, p. 141). Thus, while films and novels may employ a temporal sequence that shifts backward and forward in time, games generally rely on a temporal structure that is far more linear and sequential in its nature. Juul notes that game time has largely been unidirectional and linear, suggesting that while other established forms of narrative have demonstrated a capacity for non-sequential temporal sequences, the fixity of these narratives' "past events" allow for this structuration. Thus it may be easier for a film or novel to represent a narrative in non-sequential order, as the events have already happened; in the case of games, the narrative is unfolding in game time during play and thus is always happening "in the present." Juul proposes that this mapping between the time in the player's "real world" and the time in the game world emphasizes this present: "In this way, there is a basic sense of *now* when you play a game; the events in a game, be they ever so strange and unlike the player's situation, have a basic link to the player" (2004, p. 134). Thus, whether the game constantly emphasizes speedy reactions in real time (as in the case of an action game or sports game) or if it instead slows time to a turn-based structure (such as in a strategy game such as chess), the significance of the player's action at the moment of their play is linked to the "now." Much like Juul's emphasis on the present in gameplay, Barry Atkins contends that the player's focus is always upon that which is yet to happen. Atkins suggests that video games place the player's attention on "what happens next if I," shifting the focus from a traditionally-unfolding narrative to one in which the player is the center of the narrative and always future-oriented (2006, p. 137). In this fixation on the future, the player's recognition of and familiarity with the patterns of the game environment can play a significant role in his/her success.

Given that video games are inherently computational structures, it is helpful to build from Juul's description of the game as a "state machine" (a term he borrows from computer science), in which the system's functional state and output are determined by the player's input (2004, pp. 132–133). In the most rudimentary sense, games are rule-based systems governed by changes in states. Video games process data input by the player in accord with these rules and output a change in the game state in response to these data. In turn, the player inputs more data, and the loop continues, with the player constantly responding to changing game states. Successful play of a game requires proper response to the game's state, and it should be noted that even non-digital games are almost entirely state machines in which a state or finite set of conditions exists and then is altered by the player's or players' play. Consider a game of chess. To begin play, the pieces for both sides are arranged in a pre-determined pattern on opposite sides of a board. When the first player moves a piece, the board and game's state changes in a discrete fashion, altering both the configuration of pieces upon the board, but also the resultant possible moves (as defined by the rules of the game); a game's capacity for repetition is linked to these discrete changes in the game's state. In chess, one may replay famous matches (or portions thereof) by replicating the precise moves or "states" within in the game. There are a finite number of types of pieces in a chess game and a similarly limited number of places that they may occupy and thus a game of chess may be precisely repeated. The state machine model also offers predictability: a particular input, when combined with the current "state," should produce the same output.

To varying degrees, most video games demonstrate essential elements of predictability in both their play and the behavior of their non-player characters (NPCs), which are controlled by artificial intelligence (AI) routines. This predictability is strongly linked to the pleasures of play, from video games with the most rudimentary AI behaviors to those that are the most multifarious. For example, if, via observation from play or replay of a game, a player can predict that the aliens in *Space Invaders* (Taito, 1978) will constantly move from left to right, then s/he may plan his/her actions accordingly. Similarly, a player of *Halo* (Bungie, 2001) will learn that certain NPCs use cover and hide behind elements of the game landscape (such as boulders) to better protect themselves when the player is assaulting and then conversely become more aggressive when the player is not attacking, allowing him/her to develop better play strategies, through what Grodal terms "repetitive learning processes" (2003, p. 153). As he describes, this process of learning these mechanics of a game progress through the stages of *unfamiliarity and challenge* (the player first must learn the game and strategies requisite for its play), to *mastery* (here, the player grows accustomed to the game world and achieves a level of immersion in his/her play due to this familiarity), and finally to *automation* (the player's play becomes mechanical as the game world becomes overly predictable, often resulting in the player ceasing to play the game) (2003, p. 148). The ways in which the player learns the play mechanics of a game differ considerably between video game genres, as do the methods by which game genres use repetition; puzzle games with fairly simple controls and play mechanics such as *Tetris* (Alexey Pajitnov, 1984) engender a rapid degree of mastery and automation while genres with more complex mechanics may require the player to play and replay such games many times in order to master them.

In "Beyond the Pleasure Principle," Sigmund Freud argues for the relationship between repetition and pleasure: "repetition, the re-experiencing of something identical, is clearly in itself a source of pleasure" (1920, p. 36). Freud associates the pleasures of repetition to his observations of a childhood game based on the anxieties and pleasures provoked by the dual processes of disappearance and return of a familiar object. In his/her desire to successfully navigate a game space, a player must persistently replay the section in order to perfect his/her play and gain mastery over the space; this connection between mastery and pleasure further supports Grodal's "aesthetic of repetition" at work in the video game. Similarly, Wolf suggests that the tendency of games to loop obstacles (such as in the case of the repeating traffic pattern through which a player must guide a frog in *Frogger* (Konami, 1981)) is indicative of the need for the player's familiarity with and mastery of both spatial and temporal structures within a game (2001, p. 81). The player's mastery is thus linked to predictability in game behavior and its patterns of movement through repeated play; platform games including *Donkey Kong* (Nintendo, 1981) and *Super Mario Bros*. often prominently feature predictability in the movement of NPCs, platforms, and hazards.

Industrial Strategies in Arcade and Home Video Games

Industrial practices have emphasized repetition as a means of helping to both introduce consumers to video games and to allow players to learn how to play them. Many video games are fundamentally built around challenges of physical dexterity or logical problem-solving. Players must typically manipulate an interface, such as a gamepad or joystick and several buttons, to control an avatar or sequence of events presented on an electronic screen. The player must inevitably complete trials that range from the rudimentary (i.e. move a character from one game space to another) to the considerably more conceptually complex (i.e. solve a puzzle to acquire an object from one game space that may only be used in conjunction with several other objects to overcome another obstacle). Video games commonly privilege exact and dexterous manipulation of game elements—most often, the player character's avatar—in order to succeed within the game's system of scoring and play. In order to reduce player frustration, games that require such exacting control often incorporate mechanisms to accommodate the learning curve inherent to the variations of their interfaces and play mechanics. Through these mechanisms, a player is given more time to learn the mechanics of play within a given game, rather than immediately ending the game upon a player's mistake. Perhaps the most readily apparent paradigm of this type of mechanism is the notion of "lives" or "tries" in a game, which were popularized by early arcade video games such as *Space Invaders* and can be traced to earlier electromechanical games and pinball games. This mechanism effectively allows the player several (most commonly, three) attempts within the same particular game instance. If a player fails to navigate a particular section (for example, being caught by a ghost in a game of Ms. *Pac-Man* (Bally-Midway, 1982), a "life" is deducted from the player and the game's state is reset to an earlier moment or difficulty level at which the player lost the life. In some games, players may be awarded bonus lives for reaching specific goals within the game such as accumulated point totals, effectively rewarding the player for precise play and extending the length of his/her game. In addition to alleviating player frustration, the development of this game mechanic can also be read as an industrial strategy, given its popularity in arcade games in which players must pay each time they play a game. The video game's incorporation of repeated attempts as a core mechanic thus clearly evinces repetition's function as industrial strategy.

It should be noted that as games became increasingly popular in domestic settings on personal computers and home consoles, more nuanced mechanisms for extending play became prevalent, and were occasionally linked to the emergence of other game genres such as role-playing games (RPGs). The first-person shooter (FPS) *Castle Wolfenstein 3D* (id Software, 1992) allocates the player only one life, but instead employs a heath meter that fluctuates upward and downward respectively based on injuries sustained and healed by the player's avatar. As a player learns the mechanics of play and attempts the navigation of the game's spaces, his/her avatar may be gradually injured (in lieu of being killed outright), allowing the player to learn how to better negotiate the game and manage his/her avatar's virtual health state. While arcade games often function by a player inserting coins to play, home games are most typically purchased outright by the player for a far greater amount of money. The pronounced difference in cost between games designed for arcade and home markets has effected an assessment of the price of the purchase of a game for the home as measured against its long-term recreational use-value; this valuation of a game's potential for pleasurable return on investment is termed "replay value," by which a game's potential for continued play after its completion is measured. As such, games designed for arcade settings tend to demonstrate broadly dissimilar tendencies toward average length of play, while games designed for domestic settings (which are thus sold to the consumer) are characterized by significantly longer investments of player time and a pronounced propensity toward game designs that incorporate a degree of finality and completion; this tendency toward games that can be "finished" has placed an increased emphasis on "replay value" for home games as a means to increase the player's desire to play the game again after it is has been completed—and thus increasing its perceived recreational use-value.

Given the linkage between a game's perceived replay value and the likelihood of its purchase by a player, varied game design and industrial strategies have emerged as a means of increasing a game's replay value. Perhaps the most common method of adding "replay value" to a game is via the addition of a multiplayer mode, effectively adding the indefinite variability of the actions of other players to the game's play mechanics. Another technique of adding replay value establishes set rules of play and then randomly generates the content of the game in an attempt to effect a unique play experience each time the game is played (within the confines provided by the game rules). Such an approach could be compared to a sporting event—the rules and regulations of a given match are pre-determined, but each instance or game played of the sport results in a relatively unique outcome. An early example of such a game is *Rogue* (1980), a game first developed by students Ken Arnold, Michael Toy, and Glenn Wichman on large computer mainframes found in research institutions. Each time the fantasy dungeon-exploring game *Rogue* is played, it randomly generates the maps and the challenges that the player will face, producing a unique game experience each time. Consequently, *Rogue* is an example of enormous replay value—the game proved so successful that the developers released a commercial version of *Rogue* in 1983. The replay value that is the product of *Rogue*'s style of generative content and can be clearly traced to later, far more financially successful games such as *Diablo* (Blizzard, 1996) and *Spore* (Maxis, 2008).

Super Mario Kart (Nintendo, 1992), an example of a fairly simple go-kart racing game, allows players to record their lap times on the game's race courses. Players may then compete against existing records on the track, which are recorded as "ghosts" against which the player races. Here, the player replays sections of the game (in this case, race courses) in order to directly challenge his/her previous navigational attempt of these same spaces. The player's desire for perfection is thus inscribed into the play of the game itself, with each successful iterative navigation overtly evincing Freud's proposed "instinct towards perfection." In this sense, the play of the player is recorded to augment and supplement subsequent replay—rendering replay as a central component of play. Other games make use of this variation of repetition in distinct yet analogous fashion, placing a pronounced emphasis on sectional mastery as a means of advancement. *Gran Turismo* (Polyphony Digital Inc./Sony, 1998), another racing game, incorporates timed portions that reward players with incremental bonuses and rewards for completing sections within specified time requirements. Similarly, the practice of obliging the player to repeatedly navigate spaces until s/he can perfect that space is evident in games such as FPS *Call of Duty* (Infinity Ward, 2003). Rather than using the mechanic of providing a player multiple lives with which to traverse a large gamespace, *Call of Duty* instead supplies its player only one opportunity to negotiate a space, but instead limits the size of the space and automatically saves the player's progress through a larger game space at regular intervals. As the player's progress through each game level is regularly recorded, s/he must only start at the last point at which the game saved if his/her character is killed. In particularly challenging areas of the game, the player is thus compelled to repeat the same section over and over until s/he can successfully navigate it. Again, processes of trial and error are privileged in games such as these, as the player must iteratively attempt different strategies in successive replays of specific portions. While somewhat dissimilar to the sectional replay engendered in *Super Mario Kart*, repetition in games such as *Call of Duty* is all but compulsory; repetition thus functions in related but unique fashions in these examples from genres of the racing game and the FPS.

Games that explicitly or implicitly encourage the replay of their entire text can effectively multiply the amount of play time with minimal financial investment in terms of game development costs; this tactic is more common in more narrative-oriented games such as adventure games or RPGs. For instance, if a game involves the exploration of a haunted house that concludes when a player navigates all of the rooms in a house, allowing the player to restart the game by exploring the same house with some degree of variation would be far cheaper to incorporate than designing another house for the player to explore. A player of *Resident Evil* (Capcom, 1996) who has completed the game is "rewarded" with the opportunity to replay the same game with a different costume for the player character (or as a character with the same attributes but a different visual representation). Other games offer more varied experiences in their comprehensive replay. For instance, *Hero's Quest: So You Want to Be a Hero* (Sierra On-Line, 1989) allows the player to choose one of three different types of character when s/he initially starts to play, and each type of character allows the player access to different areas of the game and pre-determined sequences. Later games such as *System Shock 2* (Irrational Games/Looking Glass Studios, 1999) and *Deus Ex* (Ion Storm, 2000) incorporate RPG elements and let the player assign his or her character's specific skills and attributes and develop them through play, solving the puzzles in each game in different fashions as the player chooses (i.e. sneaking past a guard with a stealthy character versus confronting the same guard with a more aggressive character); these games' designs provide for an inherent flexibility in problem-solving, permitting players to replay the game and complete it with different play strategies on successive replays. Similarly, in *Dead Rising* (Capcom, 2006) players may restart the game with the same developed version of their character—thus allowing players the benefit of controlling a more capable character immediately rather than tediously developing the character from scratch once again. In these ways and others, game developers may add more replay value to a game by encouraging the player to re-experience the same game in new ways.

"Instant" Replay

The use of repetition as a core game mechanic is further—and far more complexly—evinced in games such as Jonathan Blow's *Braid* (Number None/Microsoft, 2008). The centrality of replay to *Braid*'s core mechanic is made plain by the player's sustained capacity for rewinding time throughout the game; at any instance, the player may choose to replay his/her actions by rewinding time and adjusting their actions. It should be noted this game mechanic can be found in earlier games such as *Blinx: The Time Sweeper* (Microsoft, 2002) and *Prince of Persia: The Sands of Time* (Ubisoft, 2003). In *Braid*, this interaction with the past is furthered in different levels of one of the game's worlds, each of which employs a different temporal play mechanic.

Rather than merely focused on the now and the near-future as Juul and Atkins suggest is common in video game play, the player instead finds himself/herself in a dialogic relationship with the present, future, and past. Grodal's "aesthetic of repetition" gains new significance as actions and behaviors of the past shape the present, but these past interactions become charged via the player's ability to actively engage and interact with them.

Braid thus marks a profound shift in the role of repetition in the play of video games; by weaving repetition so tightly into the navigation of the game's environs and the solution of its puzzles, replay effectively becomes the central component of its play. The player's comprehension of, interaction with, and eventual mastery of *Braid*'s variable temporal behaviors and structures are all required in order to solve the game's puzzles and to progress through its levels. *Braid* compels the player to un-learn familiar spatiotemporal constructs and representations in order to successfully navigate both the game's *spaces*, but also its *times*. This shifts the core game mechanic of the platformer from one of spatial navigation to one of temporal navigation, boldly intimating possibilities for novel ludic and narrative structures made possible by interactive technologies.

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27

SINGLE-PLAYER/MULTIPLAYER

Daniel Joseph and Lee Knuttila

Single-Player/Multiplayer

A gulf habitually seems to separate single-player games from multiplayer games. From the start screen of a huge swath of games, the two paths diverge. In the first, a singleplayer campaign laden with narrative components unfolds. In the second, gameplay hinges on the actions of other players, whether oppositional combat in a fighting game, or co-operatively as in some sports titles. This perceived split manifests in a variety of historical and contextual forms: it emerges from the single-player games of the frenetic, quarter-driven arcades against the social play style dominant in early generations of home consoles; or, likewise, from the solitary, single-player journeys of role-playing games (RPGs) played in suburban dens to sprawling virtual communities of massively multiplayer online role-playing games (MMORPGs). It often pops up in the interstices between the two, as in the local area network (LAN) party, alternating or asynchronous play, or local cooperative play. Without a doubt, understandings of single-player/multiplayer entangle both the context of play and type of game.

Approaches in game studies are not immune to the fracturing divide of single/multi, often bracketing off online experiences in studies of community, leaving design, narratological, and philosophical concerns in the single-player realm. Several questions arise from the slash of single/multi: what are, both material and cultural, the historic conditions that facilitate the rift? How do different schools in the loosely-affiliated field of game studies cultivate, approach, and defy the fracture? How do bounds of platforms, player action, methodology, economic, and marketing interests all shape the senses of single-player and multiplayer experiences? Moreover, if a great deal of what separates the two collapses, then what binds the two and how should we account for the multifaceted material, discursive, and cultural assemblage of single/multi?

The Scales of Single/Multi

There is debate as to what qualifies as the first video game. Often cited titles include William Higinbotham's *Tennis for Two* (1958) created for use on a round oscilloscope screen, games such as *Nim* (Ferranti, 1951) on the Nimrod computer program, or the electronic tic-tac-toe game, *OXO* (Alexander S. Douglas, 1952) built for the EDSAC computer at the University of Cambridge. Some hold that video games require a raster display device and name Steve Russell's *Spacewar!* (1962) as the winner. Many of these titles relied on alternating play between computer and player, which is unsurprising given their creation originates in the exploration of computational potential. *Nim*, for instance, replicated an existing math and puzzle game within an electronic platform to gauge processing ability. However, several games from the period did build upon the player-versus-player model found in *Tennis For Two* and *Spacewar!*, with the canonical *PONG* (Atari Inc., 1972) perhaps being the most celebrated. Similarly, single-player games also became a staple in the emergent arcade and home-console market, with titles such as *Asteroids* (Atari Inc., 1979) and *Adventure* (Atari Inc., 1979). The transition, from pre-Internet PLATO system games such as Jim Bowery's *Spasim* (1974), to the Atari ST's MIDI interface allowing up to 16 simultaneous players, to the breakthrough LAN games of *DOOM* (1993), shows how the single/multi divide evolved on several fronts, each having its own tactics and strategies in both gameplay sensibilities, social function, and marketplace concerns (Jansz & Materns, 2005; Williams, 2006).

However, a core question arises: do such teleological approaches attempt to build well-lit lanes on otherwise shady ground? Even prior to the development of video games, pinball and board games presented both sides of the play coin, but with ambiguity. Although the bouncing balls, dings, and rings may have been restricted to a single player, the competitive aspect of high scores operates as a player-versus-player operation. The idea of single-player competition certainly extends into alternating play associated with titles such as *Asteroids* and continues today with online leaderboards, achievements, and self-imposed difficulty such as speed runs (Yee, 2006; Medler, 2009; Parker, 2008). Moreover, it is not simply a matter of blurring a limit point. Many of these games and those that follow inhabit both sides with single-player play and player-versus-player play often revolving around similar mechanics. The introduction of network play, in all its varied evolutions, adds yet more layers of obtuse, murky confusion.

The point of the rhetorical blade slashes even deeper given the variety of contemporary online single-player/multiplayer experiences. Despite inclinations to subsume all MMORPGs under the acronym's umbrella, the aesthetics, gameplay, community practice, and design of titles varies greatly. Compounding and exasperating these sketched complications is the sheer variety of multiplayer components. Although some conceptual frames may hold for genres such as first-person-shooters or individual titles such as *World of Warcraft* (Blizzard Entertainment, 2004), this does not mean that they hold for online mobile phone games, or the eccentric multiplayer add-on elements of games created by studios such as Ubisoft, nor do single-player games function as a continuous whole. Thus we must see single-player/multiplayer in a continuum not only of experiences but also within multiple material scales and among incongruent cultural, material, and historical gradations.

Within Game Studies

Fortunately, the emergent collection of game studies scholarship continues to map several points in the mottled constellation that makes up the single/multi distinction. Although the lines are never clean, there are allegiances within sociological ethnographic accounts, design-oriented explorations, and among those whose focus is more narratological, literary, philosophical, ontological, or platform-based. Taken together, they comprise a topography of ruminations on just what constitutes "single-player" versus "multiplayer."

The sociological conceptualizations of games focus primarily on the social nature of play and the role of games in society. Because they root ludic practice mainly in history and praxis, social actions ground understanding while the player operates both as a subject of, and an object within, play (Ehrmann, 1968). Expanding upon the work of Johan Huizinga ([1938] 2000), scholars such as Roger Caillois ([1958] 1961) illustrate the tendencies of this methodology. Pursuing the social meanings of games and the implications of their use, Caillois builds a classification system for games that distinguishes multiple-person play, which hinges upon competition (billiards or chess, for example) from individual experiences occurring in a wide range of backdrops (mimicry in role-playing or the pleasure of disorientation in activities such as sports).

The growing cultural presence of games and the rise of discipline-friendly multiuser domains (MUDs) and their heir apparent, massively multiplayer online games (MMOGs), drew more sociologists to games. Scholars (Ducheneaut & Moore, 2004, Hancock, 2006; Lisk et al., 2012; Schmierbach et al., 2012) narrowed in on the multiplayer dynamic as the driving element of their study. The mediation of sociality, whether in open, virtual exploration and world creation as in *Second Life* (Linden Research, Inc., 2003), or the more traditional task-orientation of *Ultima Online* (Origin Systems, 1997), quickly became the common investigative thread. This is not to suggest conclusions or approaches need to remain uniform. Examination weaves from elements of players themselves (exploring demographics and the ethnographic exploration of motivations) to their interactions (elements of role-play, competition, and cooperation) to in-game community formation (procedure and behavior associated with guilds). Despite these differences, there is the tendency of the field to continue to locate both positive and negative relations within larger social structures and behaviors.

Against these upward loops into the social sphere of game consumption, other scholarship traces games downward and backward to game creation. Theorization focuses on the design choices concerning players, interactions, and gameplay processes (Salen & Zimmerman, 2003). Design, in this regard, sets up player strategies against a procedural rule set, such as in a game of Solitaire, *Pac-Mac* (Namco, 1980), or *Angry Birds* (Rovio Entertainment, 2009). Alternatively, design may push players into the supposed “magic circle” of play, in which they use rule sets to test their skills against one another as in games such as *Halo 4* (343 Industries, 2012).

Early examinations of games from a humanities perspective yielded interesting conceptions of single-player/multiplayer, focusing chiefly on story-driven, ostensibly singleplayer games. Janet Murray’s (1997) work, for instance, places readers and authors on opposite sides of the digital text, with active readers in an ongoing but heavily one-sided conversation with the procedural author. For Murray, the most important element of the procedural author is maintenance of the reader’s liminality; that is, keeping them immersed in the active game world. Yet in the context of rich gaming experiences, the procedural author is always negotiating the tension between giving the reader too much choice (resulting in a disjointed or rather shallow story) and too little choice (resulting in very little reader participation). Seen in the light of this “narratological” dialogue between the procedural author and the reader, video games operate as a kind of mixture of single-player decisions and indirect, asymmetrical “multiplayer” authored actions.

From these initial simple concerns, an intertwined dichotomy of considerations and conceptualizations branch outwards in game studies literature. With some scholars asking if designs—in this case, the virtual worlds and games—can themselves be creative actors, given their hugely substantial creative and play functions (Maher et al., 2005). Teasing these ideas further, we might begin to wonder if game engines and virtual spaces are players in-themselves, playing equally-weighted roles. Along these lines, Klastrup (2009) encourages researchers to view MMORPGs, and virtual worlds generally, as *complete worlds*, full of individuals, objectives, laws, social norms, technologies, and regulators. Rather than allowing the single/multi divide to operate as a launching point for distinct and separate types of play, interaction, and affect, opening the definition of active "player" creates a gradation of multiplayer "presences" in the cultural and technological assemblage of the video game.

One way of moving beyond a single/multi duality is to look at a game's hardware, software, manufacture, and social context, which has been the goal of platform studies (Montfort & Bogost, 2009; Jones & Thiruvathukal, 2012; Maher, 2012). In the case of the Atari VCS, the ways in which single-player and multiplayer were embodied and acted on links to the constraints of the chipset's memory and the ability of the electron gun in a CRT television scan lines. As a consumer product, the platform design reflects contextual use in the various living rooms and dens of average middle-class American families, as the wood grain aesthetic attests. In the process, video games continued to march down the road toward domestication in living rooms and dens across America, a journey that began with Magnivox's Odyssey console in 1972. This domestication took place in a dialectic with public places such as Andy Capp's Tavern and Chuck E. Cheese Pizza Time Theatres (Harvey, 2012; Montfort & Bogost, 2009). Simultaneously, players across the United States competed for high scores in these semi-public spaces in an manner best described as indirect (through high scores) or in head-to-head competitive play with other bar patrons, while home consoles normalized play exclusively against those in the same physical space of the living room. Here we see the intersection of physical spaces, marketing strategies, and hardware in an assemblage of single/multi.

Assemblages of Multi/Single-Play

While there is clearly no lone understanding of single/multi in game studies, there is a tendency to divide the realm of games into this duality. It is clear that MMORPGs make up an immense constellation of ethnographic research projects oriented toward the social, that have close allies in projects focused on interaction in player-versus-player titles, whether fighting games or first-person shooters. Research projects examining platforms and design tackle bits and pieces of the same game titles, while more literary-based research pursues the player through the terrain of procedural experience. Nevertheless, there remain jagged, disconnected ends. Against this toothed separation, we wish to conceptualize single/multi as assemblage: a mesh of objects and relations, including, but not restricted to, the collective bodies made up of human players, marketing strategies, commodity chains, intentional design goals, and hardware limitations.

The term "assemblage" originates in the philosophy of Gilles Deleuze and Felix Guattari ([1980] 1987), who employ it to speak of the "machinic assemblage of bodies, of actions and passions; an intermingling of bodies reacting to one another" while simultaneously operating as "a collective assemblage of enunciation, of acts and statements" (p. 88). It gains, among other things, a particular theoretical usage through the neo and vital materialism of Jane Bennett (2010) and Manuel DeLanda (2006), both of whom are particularly interested in the agency of a widened and full scale of actors. They imbue innumerable things with autonomy, such as garbage, architecture, or electrical power grids. In assemblages "efficacy is then distributed across an ontologically heterogeneous field, rather than a capacity localized in the human body or in a collective (only) by human efforts" (Bennett, 2010, p. 23). These assemblages have no head and thus have uneven power distribution and emergent effects. Nor are they singular, as components of an assemblage enter and exit relations and functions in other assemblages. Individuals in the assemblage have power, but the power of the assemblage is distinct from the individual. Moreover, as Deleuze and Guattari articulate: the capacity to effect is both material and expressive, thus operating in a plethora of ways.

T. L. Taylor (2009) has made inroads into game studies with assemblage theory, calling on researchers to attend to what she calls the "assemblage of play":

> Games, and their play, are constituted by the interrelations between (to name just a few) technological systems and software (including the imagined player embedded in them), the material world (including our bodies at the keyboard), the online space of the game (if any), game genre, and its histories, the social worlds that infuse the game and situate us outside of it, the emergent practices of communities, our interior lives, personal, and aesthetic experience, institutional structures that shape the game and our activity as players, legal structures, and indeed the broader culture around us with its conceptual frames and tropes.
>
> (p. 332)

Taylor notes that assemblages do not simply operate along methodological lines, but rather function as an ontological framework. In this way, she evokes the work of Bruno Latour (1987; 2005) who relies on the individuals or actants in assemblages to draw and direct research. Trailing these cues, single/multi is neither a duality nor concurrent processes, but rather a dynamic set of individual voices that may link loudly in a chorus while maintaining forged alliances with parts barely audible and competition against disconnected fragments singing different tunes and chords.

Genres: Unfamiliar Points in the Assemblage

The heavy focus in game studies on MMOGs and popular online shooters makes sense given their cultural presence. However, games such as *EVE: Online* (CCP Games, 2003) or *Call of Duty: Black Ops* (Treyarch, 2012) only enjoy such success by cornering significant portions of the marketplace. With development and marketing budgets in the tens of millions, they can afford expanded content and software updates. Similarly, these games lean upon their large player base to create vibrant communities, generating in-game sets of normalized behaviors, player-to-player policing of play practices, paratextual walkthroughs, and unofficial discussion forums. In terms of assemblage, the size of these networks affects and is affected by material elements. For instance, a huge benefit of having a massive pool of similar games using established network servers and a sprawling player base means that elements such as "matchmaking" services allow players to use "playlists" and jump into a game without waiting too long for servers to play on. Lowering the technological barriers of negotiating "server lists" ensures well-populated online communities that in turn generate financial incentives for developer's ongoing support. From these material components, expressive functions grow; for example, preferences for types of gameplay within certain servers. Conversely, these material elements can break down the strength of the assemblage: attempts to funnel games through the unpopular content delivery “Origin” service by game publisher EA strengthened alliances to rival services such as Steam and GoG, or community pushes toward private servers. With each step, all of the actors and forces in the assemblage face changes, revealing networks of relations under these seemingly-stable instances of play.

Despite the prominence of these larger titles in game studies, there are many outliers.

As action-based multiplayer games saturated the console market, the French-owned multinational video game developer Ubisoft began developing unusual multiplayer modes. Rather than compete on the same terrain of the considerably more successful military-themed shooters in the *Call of Duty* franchise, Ubisoft has consistently dabbled in creating online multiplayer games that, for the lack of a better term, are weird. Their action-stealth franchise *Splinter Cell: Pandora Tomorrow* (Ubisoft Shanghai, 2004) introduced a “Spies vs. Mercenaries” mode involving two asymmetrical teams engaged in combat over the control of a series of computer mainframes. The mercenaries team operates in a first-person perspective using assault rifles, multiple vision modes, and tripwire mines against the spies, who manoeuvre their characters in a third-person perspective, unarmed save for a series of gadgets such as smoke grenades and a taser.

Ubisoft inserted some unconventional forms of multiplayer play into their *Assassin’s Creed* Series, with *Assassin’s Creed: Brotherhood* (Ubisoft Montreal, 2010). The initial multiplayer modes borrowed heavily from existing traditions such as escort, assassinate, or chest capture. However, the following release, *Assassin’s Creed: Revelations* (Ubisoft Montreal, 2011), expanded gameplay and attempted to align the experience to the narrative components of the series. Rather than using bots as stand-ins or replicants of human actions, players in deathmatch mode gain tactical advantages by not using special abilities and blending in with the stiff, robotic actions of computer characters. The topographic map of this genre reveals a hybrid form, laden with tensions among a slew of actants in the assemblage: marketplace conditions (separation against existing titles), genre expectations (third-person and first-person action games), and the phenomenological experiences of players (versus peers and bots). Exploring the various corridors, passages, conflicts, and alliances of these assemblages, not only does single/multi become a multifaceted notion dependent on material and expressive effects, but also the idea of competition fall into crisis. Akin to the problems encountered associated with genre, starting to overhaul any overarching notions allows concepts such as co-op or peer-versus-peer to be understood in orientation to specific material conditions, precise relations with actors, and individuated instances of single/multi.

Platforms: Shifting Terrain of the Assemblage

A key aspect of any assemblage is the way it exercises different sets of capacities, which can lead to macro-assemblages or micro-assemblage with individual capabilities. Thus, just as a wide net is required to understand how the *Call of Duty* and *Assassin’s Creed* franchises operate against (or with) fiscal pressures, user expectation, and established gameplay mechanics, types of multiplayer and single-player games are both strengthened and weakened across platforms. With the ongoing proliferation of games for mobile phones and tablets, the particular propensities of single-player/multiplayer games change. Although the entry into the market may be smaller than consoles and bear more similarities to the PC, the mobile game market remains highly saturated, meaning individual titles and games attempt to gain consumer visibility on several fronts.

The interactive entertainment company Kabam makes free-to-play games that mimic mechanics of popular MMOGs. Their title *Arcane Empires* (2012) designed for iPhone, iPad, and Android devices draws upon the city-building play of strategy games with players constructing different sets of buildings, raising armies, and managing population resources and happiness, while the game also angles into MMOG systems of peer-versus-peer battle, alliances, global chat, and so on. Temporality is a key aspect of the game system, as most tasks rely on elapsed real-time counters, which purchasing ingame coins can circumvent. Unlike PC MMOGs that rely on complex control schemes, titles such as *Arcane Empires* must develop key schemes based on a touch screen. One element recurrent to many multiplayer titles, especially MMOGs, is extended play sessions allowing multiple player tasks and community actions such as raids to play out, which conflicts with mobile gaming's function as frequent and temporary entertainment. Granted, iPads and mobile phones garner great attention for prolonged periods, yet popular titles often function equally well between bus stops or for hours at home.

Economic choices (the free-to-play price but pay-for-convenience structure) and gameplay elements (simplified control structures) attempt to draw in the widest swath of players through hybrid game types, employing aesthetic styles that hold some cultural cache (in the case of *Arcane Empires*, steampunk), and all of these aspects effect a game's development, advertising, lifespan, player interactions, and so on. It is tempting to align the popularity of single-player titles such as those of the *Angry Birds* franchise to the playful aesthetic or simple controls yet this overlooks a wide network of factors. Equally, while the charms of the briefly popular *Draw Something* (OMGPOP, 2012) may seem to be the delight of player-to-player exchanges against the limits of the drawing palette, there is an array of factors at work. On multiple fronts, mobile titles frequently perform a balancing act of capitalizing on assemblages with strength (game type, aesthetic trends, temporal player tastes, familiarity or curiosity in the casual game market, and so on) with simultaneous attempts to destabilize others in order to gain traction, especially in gatekeeper distribution platforms such as the iTunes store. Seeking out how spaces of play (from desks to train seats to sofas), the borrowing of other platform styles, and the rebalancing of them against the limits and abilities of a platform, drive yet another questioning of monolithic categories such as cooperation or competition, while opening new avenues to think of material and expressive effects at work.

Conclusion: Assembling the Actors

There may seem to be a danger in refusing a central hub, single determining force, or widely-cast net in an attempt to tow such a wide assortment of gradations of active actors. The power of the assemblage lies in its open ontology. Rather than approaching single/multi as an epistemological case to solve, rummaging through the vital properties within an assemblage unearths the effective power as a larger accumulation. "Single-player" and "multiplayer" *do* work as large-scale assemblages. As the brief sketching here shows, they develop individual deployments with other particular entities: among different players, developers, economic conditions, platforms elements, aesthetic systems, socio-political conditions, and so on.

As DeLanda states in A *New Philosophy of Society: Assemblage Theory and Social Complexity* (2006) “capacities do depend on a component’s properties but cannot be reduced to them since they involve reference to the properties of other interacting entities” (p. 11). Moving beyond single/multi as a bland, immeasurable throng of elements, the work becomes mapping among all the irreducible, multi-tiered, and changing elements and relations. Elements such as cooperation change game-to-game meaning. Sports games cannot be lumped with MMOGs or casual mobile titles; equally, a concept such as competition bears weight in vast numbers of game assemblages requiring larger connects.

Although we propose a few key components here, to elucidate the full assemblage of single-player and multiplayer requires ongoing recognition of ordering and imagining of entities (ideas, networks, people, and organizations), all of which hold the same clout of veracity. Individual titles reveal key aspects but we must also connect these games to other assemblages up and down the ladder of scale, size, and scope—developers, microchips, players, power grids—orient understanding to other assemblages, bearings, and flows. Moreover, by seeking all heterogeneous elements ingoing or breaking apart from relations with other objects (human, non-human, material, and immaterial), flops, and failures, the strange and unusual power to change the assemblage emerge.

What forms is not a massive, muddled painting globbed with too many colors because the assemblage foregrounds the process in which elements are “naturalizied.” To remove the given that the material conditions of the iPhone operate causally to create the player’s experience of touch is to seek how such expressive ideas operate and become stable among developers or players or communities or material parts. On this point, the assemblage gains political force, and to speak of multiplayer gaming in its current form is to speak of communities that frequently employ sexist, racist, and homophobic language; to explore single-player experiences is to subject oneself to recurrent misogynist tropes and mechanics of violence. By leveraging outward to the components of assemblages of games, the borders of the spaces of play open to larger and smaller uneven flows of power and privilege. In turn, we can challenge, destabilize, and disrupt the alliances that propel them in all the varied single or multiple forms.

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Part IV

GENERIC ASPECTS

28

ACTION

Dominic Arsenault

The term “action” in the context of game studies refers to two distinct fields of inquiry. In the first, broadest sense, the study of action stems from a variety of fields such as the philosophy of action, cognitive psychology, and interaction design. Paul Ricoeur’s *From Text to Action* (1991), to name a single work, breaks down a “conceptual network of action” through five components: goal, agents, motives, circumstances, and cooperation. Accordingly, game studies scholars have examined the general processes, conditions, and modalities that govern the undertaking of actions by video game players. See, for instance, Aki Järvinen, here adapting Nico Frijda’s model of phasic emotions (Frijda, 1986):

> [G]ameplay consists of phases that are analogous to those of the emotional process; there is recognition of something significant in the game in its present state, followed by the player’s appraisal of the situation and what to do. After that, the player proceeds to take actions within the rules, as action readiness transforms into concrete action.
>
> (Järvinen, 2008, pp. 87–88)

The second and more widespread meaning of “action” is usually understood as a genre of games, as Thomas Apperley’s short description highlights:

> The action genre consists of two major subgenres: first-person shooters and third-person games. […] Action games in particular are often intensively performative, in a manner distinctly different from other genres of performative games, in that it is action games that will often require the player to engage in extreme nontrivial actions in order to make the ergodic traversal […]. The abilities possessed by the avatar of the player must be activated by a technical performance by the player.
>
> (Apperley, 2006, pp. 15–16)

This commonplace usage, however, does not translate onto the academic sphere as well as it should. Even taking into account that “there is a curious lack of genre studies” in video game studies (Klevjer, 2006), surprisingly little has been written on “action games.” Part of the problem might be that such a categorization is not specific enough, such that any study of a group of games will focus on a given “subgenre,” such as the first-person shooter.

In this sense, video game genre shares some of the essential properties of film genres; this is why Aki Järvinen’s critique of Mark J. P. Wolf’s genre typology (“if we see genre-based categorizations as a means of making sense out of a larger whole, 42 genres ceases to be useful,” in Järvinen, 2002) echoes film scholar Barry K. Grant's remark that

> however defined, generic categories must be useful. Categories such as narrative, documentary and abstract or experimental, while they do cover the range of possible types of filmmaking, are too broad to be very useful for genre criticism.
>
> (Grant, 2007, p. 23)

This appears to also be the case for the "action" label, which may suit the needs of general commentary, but whose expansiveness becomes meaningless in a more involved context. Significantly, in many game studies books, journal articles, or papers dealing with formal aspects of games, genre definitions or typologies do not feature an entry for "action games" in their index or abstract (even when they provocatively enough list both "action-adventure" and "adventure"), while scholarly work that does not address specific details of gameplay or categorization (such as studies of psychological effects of games, to name but one example) happily use the term off-handedly.

All in all, it seems that a term such as "action game" is more or less taken for granted in commonplace usage, but not precise enough for the needs of specialized study. "Action games" stands, in the words of Tzvetan Todorov (1978), as a historical genre (whose existence can be pointed to in historical reality by referring to paratextual materials such as game reviews, marketing, etc.), without a corresponding widely agreed-upon theoretical genre (an analytical category that can be deduced or conceived, abstracted from any given incarnation). The need for a definition therefore constitutes our first point of inquiry.

"Action" as a Super-Genre of Games

By all accounts, the "action games" genre appears to be something of a higher-level qualifier, and not exactly akin to game genres as we usually know them. To illustrate its self-evident nature, consider that Alexis Blanchet (2010) supplied a succinct definition of "3D action" only in the glossary of his book, intended for the reader who is unfamiliar with video games: "3D Action: video game genre that represents game environments in 3D, and that relies on the player's reflexes and skill through interactions played out in real time" (Blanchet, 2010, p. 441; my translation). Laird and van Lent go for a simpler and more subjective, but perhaps more accurate, description: "Action games are one of the most popular game genres, and involve the human player controlling a character in a virtual environment, usually running around frantically using deadly force to save the world from the forces of evil" (Laird & van Lent, 2005, pp. 205–206).

One of the more rigorous definitions of the genre appears in Chris Crawford's seminal *The Art of Computer Game Design* (1984). His work toward a taxonomy of computer games was founded on a broad divide in two categories: "skill-and-action games" and "strategy games." While some of the remarks in Crawford's introductory paragraph on skill-and-action games might appear antiquated and bring a chuckle to the contemporary reader, the definitional points that I emphasized in the citation are still valid, 30 years later:

> This is easily the largest and most popular class of computer games. Indeed, most people

> associate all computer games with skill-and-action games. All arcade games are S&A games and almost all games for the ATARI 2600 are S&A games. *This class of games is characterized by real-time play*, heavy emphasis on graphics and sound, and use of joysticks or paddles rather than a keyboard. *The primary skills demanded of the player are hand–eye coordination and fast reaction time*. I group skill-and-action games into six categories: combat games, maze games, sports games, paddle games, race games, and miscellaneous games.
>
> (Crawford, 1984, pp. 25–26)

The defining factor of "action" games thus appears to be the importance of the player's sensori-motor skills (which includes both hand–eye coordination and reaction time) in performing the various actions needed to progress through the game's challenges. Beyond this very general requirement, genre labels provide more precise categories for certain subsets of action games, and are usually employed by researchers looking to study a given corpus of games.

It should be noted that genres are historical constructs, brought about by discourses on games rather than by the games themselves (see Arsenault, 2009). Hence, Crawford's six identified "categories" of action games (combat, maze, sports, paddle, race, and miscellaneous), on the one hand, will evidently not conform to the historical reality of the 2000s or 2010s. The kind of reality described by the broader term "action," on the other hand, does not seem subjected to the same historically-restricted existence. Interestingly, Crawford's "miscellaneous" category perfectly describes the role that the "action game" label plays among the landscape of genres in video games:

> My taxonomy is flawed; there exist a number of games that do not fit into this taxonomy very well. The first I will mention is DONKEY KONG (trademark of Nintendo), a game that looks vaguely like a race game with intelligent obstacles. […] The fact that these games do not fit my taxonomy does not bother me overly much; I certainly don't want to create ad hoc categories for individual games. I am content to wait and see other developments before I create new categories or revise old ones.
>
> (p. 30)

When a game cannot be placed into a specific genre, we fall back on the higher-level term: *Donkey Kong* (1981) is a "skill-and-action game" because it can't be assigned to another more specific category (in this case, the "platform" genre that would grow in popularity during the latter half of the 1980s, following the pioneering *Pitfall!* (Activision, 1982) and the influential *Super Mario Bros*. (Nintendo, 1985)). This is the kind of situation that prevails for action as a genre: an action game relies on sensori-motor skills and real-time play, and cannot be more precisely described through a given game genre.

On the Origin of Species

To illustrate the problematic expansiveness we must deal with, it would now be a good time to pause and briefly trace the first directions taken by arcade games that would later grow into the wide variety of genres and landmark titles known as "action games." We will then use shooting and fighting games as examples of the diversity to be found under every genre label. We might say that action games debuted with the Promethean *Spacewar!* (Russell et al., 1962) and *Computer Space* (Nolan Bushnell and Ted Dabney, 1971), its arcade adaptation, but achieved commercial success through three genres: the ball-and-paddle games made famous through *PONG* (Atari, 1972) and *Breakout* (Atari, 1976); the racing games that appeared with the top-down *Space Race* (Atari, 1973), first-person perspective *Night Driver* (Atari, 1976), and eventually *Pole Position* (Namco, 1982); and the maze games that debuted with *Gotcha!* (Atari, 1973) and reached their apex with the *Pac-Man* (Namco, 1980) phenomenon.

Following *Gun Fight* (Taito, 1975) and the Atari 2600 title *Combat* (Atari, 1977), shooters quickly diversified in many sub-genres, with *Space Invaders* (Taito, 1978) and *Asteroids* (Atari, 1979) as the prototypical fixed-screen shoot ’em ups, and *Xevious* (Namco, 1982) introducing the classic scrolling shooter formula seen in *1942* (Capcom, 1984), among others. Shooting galleries also made the move from fairgrounds to televisions, with *Wild Gunman* (Nintendo, 1984) being a classic example. Another genre of action games, rail shooters, could theoretically be described as shooting galleries with a more involved fictional representation that depicts events through the continuous first-person perspective of automated spatial movements; Atari’s seminal 1983 *Star Wars* arcade game, for instance, affords the player control of shooting while his or her X-Wing starfighter pilots itself toward the end goal. The early 1980s also saw the rise of the humanoid player-character, allowing for different gameplay opportunities within the action genre such as the already-mentioned platform game, but also the “run and gun” subgenre, which emphasizes movement as much as aiming and shooting. The *Sheriff* (Nintendo, 1979) arcade game introduced the top-down variety, further popularized by *Berzerk* (Stern Electronics, 1980), *Robotron: 2084* (Vid Kidz, 1982), and *Commando* (Capcom, 1985), while *Contra* (Konami, 1987) hybridized the run and gun form with the side-scrolling platform game.

With continuous graphical improvements, characters could be depicted with greater detail and smoother animation, which opened the opportunity for the fighting game to emerge. Depending on one’s perspective, its roots can be traced back to either *Karate Champ* (Technos, 1984) or *Yie Ar Kung-Fu* (Konami, 1985); while both games cemented hand-to-hand combat as a “duel between equals” characteristic of Roger Caillois’s (1961) *agôn* game structure, *Karate Champ* can be said to be closer to a simulation of karate than *Yie Ar Kung-Fu* (namely through the latter’s usage of the health bar). In this respect, *Karate Champ* is perhaps best envisioned as being in line with *Warrior* (Cinematronics, 1979), a one-on-one swordplay fight simulator in which players control their characters’ motion through the realistic mapping and fine manipulation of vector-based graphics rather than fast-paced button mashing. Regardless of the chosen root, no one can argue that the tree of fighting games only sprang fully-grown through the success of *Street Fighter II* (Capcom, 1991) and *Mortal Kombat* (Midway, 1992). A related but different sub-genre can be found in the beat ’em up, whose formula had been prefigured by *Kung-Fu Master* (Irem, 1984) and established by *Double Dragon* (Technos, 1987), in which the player advances through levels while battering down scores of weak enemies in hand-to-hand combat.

While this short survey can never be completed in the space allotted here, it helps frame the discussion, at least historically. Covering the 1990s and 2000s would probably require twice as much space, if only because of the much higher count of games produced during these decades. We can still make a broad sweeping statement to highlight the strong grip that the first-person shooter exerted on action games during this period, from id Software's *Wolfenstein 3D* (1992) and *DOOM* (1993) to the latest entries in the *Unreal* (Epic MegaGames & Digital Extremes, 1998), *Halo* (Bungie Studios, 2001), and *Call of Duty* (Infinity Ward, 2003) franchises. The cornerstones of "action" game-play also entered other genres through hybridization practices, leading to the real-time strategy game with *Dune II: The Building of a Dynasty* (Westwood Studios, 1992) and *Warcraft: Orcs & Humans* (Blizzard Entertainment, 1994), to give two examples. Crosspollination with the role-playing game (RPG) and the adventure game led to the widespread emergence of the action-RPG and, most famously, the action-adventure game, to which we will return later. These cases also indicate that the more history unfolds, the less "action" functions as a stand-alone usable term for describing games.

Our definitional ambition is both stirred and marred by the wide range of games highlighted here. Our definition of "action" would need to not only account for all games directly labeled as such, but also to capture the essence of that gameplay component when it is referred to as part of a hybrid construct. In accordance with prototype theory (Rosch & Lloyd, 1978), a cognitive model based on "typicality gradients" as a more appropriate way of modeling the human mind's behavior through activities of classification, we would say that the "real-time" and "sensori-motor skills" traits form the nucleus of "action games," while some secondary features have a clustering tendency and can appear closer or farther away from that prototypical core, depending on specific subgenres and titles. To name a few of these secondary properties, however, will require us to take a detour through theoretical work conducted on "game actions," the reverse side of "action games," as alluded to in the opening of this essay.

Action as a Mode of Gameplay

An appropriate way of conceptualizing the label "action" might be to move away from genre, and to understand it from a modal point of view. Through this frame, "action" refers to a certain manner in which players must interact with a game to overcome the challenges and progress through the game structure. Gregersen and Grodal (2008) separate the in-game actions, usually performed through the relay of a player-character or avatar, from the gamer's own physical actions in the real environment (such as pressing a button on a controller), which they term primitive actions or P-actions: "we perform a wide variety of game actions *by* performing P-actions in relation to control interfaces: The resulting state changes in the controller are mapped to the virtual environment" (Gregersen & Grodal, 2008, p. 70). Subsequent work by Gregersen has focused on "interaction modes," as in specific ways in which players may perform their P-actions:

> [T]he interaction mode identifies *generic structures of physical activity when interacting with the total game system*. Players need to move their bodies in specific ways to affect the game system and interaction modes are thus integral to defining games as finite provinces of embodied interaction.
>
> (Gregersen, 2011, p. 101)

If we are to qualify "action games" according to this framework, we might say that those games make important demands on the gamer's embodied interactions and P-actions.

Away from the question of embodiment that lies at the heart of Gregersen and Grodal's work, Perron, Arsenault, Picard, and Therrien came up with a model of "actional modalities" (Perron et al., 2008) that identified four modes that pertain to player action in video games, from the player's perspective on the sequences of actions that he or she must perform and the type of skills that are necessary for their deployment: Execution, Resolution, Strategy, and Improvisation. "Execution relies on the gamer's sensori-motor skills" (Perron et al., 2008, p. 248), the goal of these games being to successfully implement the correct actions using manual dexterity and fast reaction time. As is readily apparent, this is the actional modality on which action games (understood as a genre or branch of games) heavily rely. An additional specification made by the model is that the gamer has access, through his or her player-character, to a certain repertoire of moves which s/he must deploy accordingly.

Through contrast with the other actional modalities, we can infer the properties of the Execution actional modality, and a number of prototypical secondary properties of action games. Execution differs from the second mode, Resolution, which is chiefly concerned with problem-solving using the player's cognitive skills, and does not hinge on a finite, standardized set of possibilities that the player must learn to master:

> Each situation must be resolved individually, and the gamer is not told in advance exactly which actions her character can perform. The same action of clicking on the screen can yield a variety of developments such as entering a conversation, jumping over a pit, stealing an object, or punching someone.
>
> (Perron et al., 2008, p. 248)

Resolution is the hallmark of the adventure game in its puzzle-solving dimension as, by definition, to puzzle someone means to confuse them with a problem whose solution is not readily apparent. The third actional modality, Strategy, is marked by reliance on cognitive rather than sensori-motor skills, but differs from Resolution in that it implies a long-term vision that extends beyond a particular given situation, and a kind of systemic coherence that many adventure games lack. It is traditionally found dominant in strategy games, but also in RPGs. The fourth modality, Improvisation, will be left out of this analysis, since it is occasionally found in games, but more often appears in other interactive practices such as hypertext literature and new media art. Improvisation poses no particular challenge (and thus involves no specific skillset), the interactor freely experimenting with possibilities in mostly haphazard fashion.

It is worth taking a single situation to exemplify the three actional modalities. An archetypal example would be the need for the player to defeat a particular enemy guarding a door. In the Execution modality, the player coordinates his or her fighting moves, dodging and blocking mechanics, special powers and combos, etc., to attack and defeat the enemy through real-time skillful interaction. In the Resolution modality, the player may need to open his or her inventory and drag a soap that he picked up earlier, drop it on a predetermined ceramic floor tile, and then click on a mop and water bucket that is conveniently lying around to cause a cut-scene to play out, in which the enemy slides on the soap and spins out of the room (and perhaps into a pit). In the Strategy modality, the player may need to gauge his or her resources of health, endurance, physical strength and attack power, and make a good series of decisions to make the most out of them. Figure 28.1 illustrates the core traits of each modality (in parentheses) as the vertices of a triangle; each core trait is flanked by secondary traits (in bold italics) that run along the two connecting edges; each modality also has an incompatible trait that appears on the edge opposite its vertex, and atypical secondary traits in the form of the other vertices of the triangle (as, quite plainly, if a given game were to show such secondary traits, it would be said to mix two actional modalities).

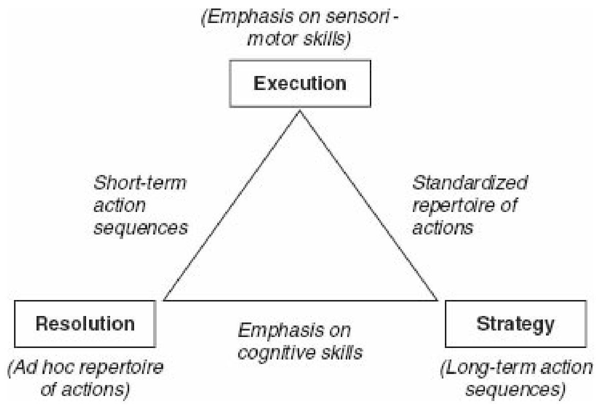

Figure 28.1 General properties that define the three actional modalities of Execution, Resolution, and Strategy, according to what they share and are opposed to.

Our definition of action games now has some solid foundations: action games favor the Execution actional modality, which means they typically rely on short-term action sequences carried out in-game through a standardized repertoire of actions, themselves implemented by the gamer through an interaction mode that prioritizes hand–eye coordination and sensori-motor skills for fine-tuned P-actions. While action games, unlike adventure games, may present the player with a coherent and fixed repertoire of actions, we must substantiate such a divide with firmer theoretical grounds if we are to tackle the popular action-adventure hybrid.

The Action-Adventure Paradox

In recent years, action has increasingly been replaced by "action-adventure," the catchall term par excellence for third-person video games in which the player must navigate a player-character through space, fight enemies, pick up objects, solve puzzles, and talk to other non-player characters. As action games and adventure games can act as polar opposites on the questions of player skills (sensori-motor/cognitive) and player-character skills (standardized/undefined), this loose definition has important internal tensions, which can be resolved in many ways. One of them, as John Feil explains, is to let the game's narrative act as a balancing mechanism:

> One genre that can't be placed in the action bucket is the adventure game. Adventure games, focusing on puzzles and story, rarely use action to entertain their audiences. Action-adventure games thus combine elements of both genres into one. While generally focusing on physical movement, they steal game-play from the adventure genre to serve the needs of the story of the game.
>
> (Feil, 2009, p. 29)

While the increasing attention given to game stories may partially explain the success of action-adventure games, it does not account for everything. Going back to the historical roots of action games, the technical constraints posed by the memory limitations, among others, should not be overlooked. Action games provided a good way of maximizing gameplay situations with a minimum of graphical assets and implementation, contrary to puzzles, which must be hand-designed and articulated independently. The action-adventure turned out to be a meaningful combination, providing a good way to mix the action gameplay logic of repetition with a progression logic of constant renewal that creates interest for the player.

While the integration of a modicum of adventure into action games may feel like a welcome change of pace and help players gather and conserve a kind of forward momentum—that is, a feeling that the action is going someplace interesting rather than being a string of disconnected challenges—the reverse is often met with outcry from adventure gamers: the integration of action-based challenges into adventure games typically has them going into fits of rage. The reason may be that the divide between sensori-motor and cognitive skills is not wholly symmetrical, as most action games still require players to figure out the one correct method required to defeat a level boss. This act requires cognitive skills to be exercised, even if the player's sensori-motor skills still play an important role in the implementation of the method. By contrast, adventure games typically do not pose any sensori-motor challenge at all.

As this essay has shown, there is room for more substantial work on the action game as a genre (or super-genre) of video games. Notably, there are methodological issues that stem from the somewhat trans-historical nature of "action" as a descriptive label for video games: many of the sub-genres that early action games helped to constitute have gone out of use, and many of the contemporary action game subgenres cannot be integrated into a unified framework or general overview that includes games from the 1970s. This situation becomes all the more problematic with the increasing computational power and digital distribution models available to modern game developers: the paradigm of mobile gaming and its new platforms, with smaller form factors and smaller engagement time windows, as well as the rise of independent games, have resulted in a sort of "back to basics" attitude that brought about the return of traditional "action games." There is, more than ever, a need for sustained theoretical work on game actions and action games if we are to fully account for the diversity of game forms and structures, for both the past and future.

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29

ADVENTURE

Clara Fernández-Vara

Adventure games are one of the earliest genres derived from the intersection of games and digital media. Although they may not be a mainstream genre any more, their continual transformation through designs and technologies illustrates the struggle in reconciling narrative and gameplay. The versatility of adventure games is the key to the genre's longevity and its constant experimentation with interfaces and storytelling explains why we keep making and playing them.

The genre takes its name from the text game *Adventure* (1976–1977), also known as *Colossal Cave Adventure*, initially developed by Will Crowther, and later expanded by Don Woods. Since then, adventure games have taken many shapes, evolving through different interfaces to find new approaches to create narrative experiences. Early adventure games were called *text adventures*, since words were the way to represent their world and to interact with it. Text adventures are also called *interactive fiction*, a term popularized by the company Infocom in the 1980s, and the preferred denomination used by current developers of this type of game. Soon enough, text adventure games started incorporating illustrations, with Roberta Williams's *Mystery House* (On-Line Systems, 1980), being credited as the pioneer of *graphical text adventures* (Montfort, 2003, p. 169). The illustrations were not interactive, but complemented the textual descriptions of each location. The combination of text interacting with the graphical environment followed: another game by Williams, *King's Quest: Quest for the Crown* (Sierra On-Line, 1983), marked a new milestone in the genre by allowing players to move the characters on the graphic representation of the screen directly, while the rest of the commands were still typed, thus paving the way for *graphical adventure games*. Later on, the use of menus allowed a more streamlined interaction, by listing the possible commands and inventory objects. Players could click on verbs, objects, and characters to compose a sentence, as exemplified by *Maniac Mansion* (Lucasfilm Games, 1987) or *Eric the Unready* (Legend Entertainment, 1993). In the evolution of the interface, mouse clicks became the main input, and command lists became icons, which abstracted many of the actions (e.g. a mouth may stand for speaking, eating, or kissing). Inventory lists also became visual, so that players could drag an object from the inventory bar directly to the world, leaving behind the sentence-like interaction. In order to focus on puzzle-solving, rather than finding the correct command, games such as *Myst* (Cyan, 1993) made the actions contextual, so that the object or character would determine what clicking on it meant: a case could be opened or closed, but not talked to. All throughout, the player interacted with the game through indirect interaction, that is, instead of moving a controller to mark the direction of the character, a command would provide the instructions for the player.

Video game consoles have generated a different strand of adventure games, since their input comes from game controllers rather than the swift movements of the mouse or keyboard input. Thus some console adventure games incorporated multiple-choice menus as their mode of interaction, typical of Japanese visual novels such as *Snatcher* (Konami, 1988) or the *Ace Attorney* series (Capcom, since 2001). Another type of console adventure games, more contemporary, bases its mode of interaction on gestures, where physical movements signify the command, thus incorporating challenges based on direct manipulation (Shneiderman, 2003) of the character and the world. For instance, in *Heavy Rain* (Quantic Dream, 2010), the player moves the controller's analog stick in a specific direction to open a drawer instead of selecting "open" from a menu.

Being Adventuresome

The adventure game genre is also defined by a specific set of design features and modes of interaction, which were established in early text adventure games. None of these features are exclusive of the genre, but their co-existence allows us to identify them as such (Fernández-Vara, 2009). Adventure games are characterized by:

- their story-driven nature;
- having a player character who carries out the commands of the player;
- their encouragement of exploration;
- gameplay focused on puzzle-solving; and
- interaction based mainly on object manipulation and spatial navigation.

In spite of the specificity of the features, which will be detailed below, the adventure game genre comprises games as varied as *The Hobbit* (Melbourne House, 1982), *The Hitchhiker's Guide to the Galaxy* (Infocom, 1984), *The Secret of Monkey Island* (Lucasfilm Games, 1990), and *Machinarium* (Amanita Design, 2009), along with the games introduced above. Other games may involve adventuring, but do not belong to the genre, such as *The Legend of Zelda* (Nintendo, 1986), *Baldur's Gate* (BioWare, 1998), or *Uncharted* (Naughty Dog, 2007). Although this second set of games may share these common features, they have added elements that distinguish them as a different genre, namely action-adventure games or role-playing games, since they do not fulfill all the necessary design traits. Let us unpack these features.

In story-driven games, the narrative unfolds as the player advances in the game. The story is more than a reward for successfully overcoming a challenge, as Juul or Klevjer argue (Juul, 2001; Klevjer, 2002); the events of the story take place as the player interacts with the world. Story-driven games provide a narrative framing to the actions of the player, making him or her a participant in the events, or turn the discovery of the events the main aspect of gameplay.

The story may seem simple: *Zork*'s (Infocom, 1980) appears to be a scavenger hunt set in a dungeon. The space, however, points to the history of the Great Underground Empire. In contrast, other games turn the player into the protagonist of complex narratives, such as the intrigues with the ancient Order of the Templars in *Broken Sword: Shadow of the Templars*, aka *Circle of Blood* (Revolution Software, 1996), or the interweaving stories in the thriller-like *Heavy Rain*.

The player interacts with the fictional world through a character. Unlike role-playing games, where players may designate their identity and qualities, the character is normally pre-defined. Usually, there are no stats associated with the character, such as life meters or skill sets that allow increasing the character’s capabilities over time. The goal of adventure games is not to improve the skills of the character, but to advance the story. There are some exceptions, of course, e.g. the player character of *Loom* (Lucasfilm Games, 1990), Bobbin Threadbare, learns new spells as he travels, expanding the repertoire of possible actions. The player character may also be generic and nameless, as is the case of the scavengers in interactive fiction (*Adventure* or *Zork*), or games using the first-person point of view, such as the *Myst* series. Some games may feature multiple player characters; instead of using them as a team, the player still controls one character at a time. The player may switch characters any time during gameplay, as in *Maniac Mansion: Day of the Tentacle* (LucasArts, 1993). More often, the game dictates who the player controls at specific points of the game. *Heavy Rain* is divided into chapters, each focusing on the point of view of a specific character.

The predominant type of gameplay is puzzle-solving; puzzles are integrated in the fictional world of the game, so the objects and characters of the story create the challenge. The solution to puzzles may rely on general knowledge, such as locked doors that need keys to be opened, or basic trading conventions. More often, the player must learn the workings of the fictional world in order to tackle its challenges. The rules of the world may derive from traditional storytelling or genre fiction: the fairy-tale kingdoms of the *King’s Quest* series hark back to traditional fairy tales, whereas *Beneath a Steel Sky* (Revolution Software, 1994) invokes dystopian science-fiction novels. Adventure games can be particularly good at creating fresh fictional worlds, mixing up cultural and media references. *Grim Fandango* (Lucasarts, 1998) is set in a bureaucratized afterlife, mixing the colorful iconography of the Mexican *Día de los Muertos* with 1930s architecture. *Botanicula* (Amanita Design, 2012) takes place on a tree inhabited by an insect menagerie, sieged by a vampire bug. The rules of both fictional worlds are different from everyday life, so the player must learn them because they create the constraints to the puzzle. For example, in *Botanicula* the player must learn which insects are friendly or hostile, and who eats who, in order to find the lair of the evil vampire bug.

The main method of interaction with the world is exploration: talking to characters, examining objects, and trying different actions. Exploration is necessary in order to make sense of the fictional world first, and then to solve the puzzles. The delights of exploration and discovery may not be as valued often in mainstream games, which tend to favor constant action and where quick rewards are predominant. In contrast, adventure games thrive on allowing players to explore the world in their own time, or at least give room to gather information, and even learn from trial and error. Exploration is also more clearly encouraged when the goal of the game focuses on piecing together the events that have taken place in the world, what happened before the player started the game. This is the case of games such as *Myst*, or the interactive fiction *Deadline* (Infocom, 1982), in which the detective player must solve a case in less than 12 hours. However, games where the story of the player (i.e. what happens as the player participates in the world) is more dominant tend to limit the space that can be explored, usually by fragmenting it in scenes (*The Hobbit*, *Heavy Rain*). Most games are somewhere in between, so that the player has a limited amount of space, but may open up new locations as the game advances. In *Gabriel Knight: Sins of the Fathers* (Sierra On-Line, 1993), the player carries out an investigation, and as new information is revealed, new locations open up for the player to explore.

The interaction in adventure games focuses on two core mechanics: object manipulation and spatial navigation. Adventure games are characterized by an uncommonly ample list of specific actions. Take fighting games, for example: the main actions are punch, kick, dodge, jump. Each verb may have different nuances, such as high/low punch, or strong/weak kick, but this gradation does not really change the core actions of the game. Adventure games involve navigating and examining the world, talking to characters (if there are any), and using objects. "Use" is a general way to refer to a large variety of actions, its meaning depends on the context: in interactive fiction, the player needs to find the exact word, which may be as common as "open drawer" or as exotic as "set pants on fire" (*Lost Pig*, Admiral Jota, 2007). As discussed above, early graphic adventure games list their set of commands in a menu, to avoid word-hunting. In other games, contextual actions do away with specific commands: if the player clicks on an object, it triggers the corresponding action: a switch will be turned on and off, a character will start a conversation.

When all these five features concur in a game, we can affirm that we are playing an adventure game. A set of features is not the only way to discuss the genre, however. The development and reception of these games is also important to understand its richness and influence on video game history.

These defining features help to map the relationships between genres, through similarities and differences. For example, Warren Robinett's *Adventure* (Atari, 1979) was conceived as an adaptation of Will Crowther and Don Wood's *Adventure/Colossal Cave* Adventure for the Atari VCS (Robinett, 2006). Since the VCS lacked textual input, Robinett created a version where the maze of twisty little passages becomes a series of screens with warping connections, the puzzles are simplified to finding the key to each of the castle gates, and combat becomes prominent, with a bat and dragons that the player has to fend off with a sword. *Adventure* shares the defining features listed above, thanks to its inspiration from Crowther and Woods's work. It also presents features that differentiate it from contemporary games: the command prompt is absent, substituted by direct manipulation, by which the player moves the character through the game controller, and drops objects through the press of a button. The emphasis on real-time actions in Robinett's *Adventure* marks the beginning of another strand of adventure games, which soon became its own differentiated genre, the action-adventure game. One can see the origins of *The Legend of Zelda*'s dungeons (Nintendo, 1986) and *Metroid*'s caves (Nintendo, 1986) in the blocky mazes and grates of *Adventure*. The differences are also evident, starting with the relative simplicity of the puzzles in comparison with those found *in The Hitchhiker's Guide to the Galaxy*, for example. Most importantly, the emphasis on direct manipulation makes action-adventure games more reliant on skill and timing, rather than puzzle solving. Although adventure games have occasionally incorporated direct manipulation (in *King's Quest: Quest for the Crown*, for instance), the predominant mode of gameplay is still puzzle-solving. More recently, gestural interfaces, as the ones found in *Heavy Rain*, have incorporated a greater emphasis on action and timing, in turn inspired by action-adventure games. Thus we see how adventure games and action-adventure games relate through common lineage, and yet remain different genres based on their emphasis on specific aspects of gameplay.

Interacting with the Simulation

Because of their strong narrative component, adventure games have been often been considered a borderline case between games and interactive narrative. There is often a pre-determined narrative, which unfolds as the player advances in the game, rather than a series of events that are the result of a dynamic system of rules, as would be the case of games involving a contest such as fighting or racing games. This fixed story is often the cause as to why adventure games have sometimes been dismissed as “linear.” Juul (2005) considers them the extreme case of *games of progression*, where the player has to complete actions in a specific consecutive order, as opposed to *games of emergence*, where the events are the outcome operating with the dynamic system of the game. This presumed linearity only applies to certain adventure games, and misconceives the nature of the genre. Although the events may be pre-determined, they do not usually imply a specific order in which they should take place; the emphasis on exploration also subverts the perceived notion that adventure games constrain the player into a specific path.

Adventure games are simulations. The first paper published in an academic journal on text adventure games calls *Zork* a “fantasy simulation” (Lebling et al., 1979). In defining the different ways to understand an interactive fiction work, Montfort states that it is “a simulation of an environment or world” (Montfort, 2011). Using object-oriented programming, the designer implements rooms, populated by characters and objects. These objects and characters have behaviors attached to them: doors open and close; chairs are for sitting on but cannot be put in your pocket; chocolates can be put in a bag, can be eaten, and, if it gets hot, they melt. There are events that can be programmed to happen constantly, such as day and night cycles, or periodically, like people walking following a specific route, or changes in the weather. The game unfolds as a series of consecutive events, but it does not mean that these games are like a film or a novel. The designers constrain how the player interacts with the world by creating the underlying system that is the core of the simulation. Those constraints come from the number of actions that may be possible in the world, or the spaces that may be accessed any one time, and is no different from other games that may be considered “simulations.” All games limit the possible range of actions, e.g. one cannot go to the bathroom in most role-playing games, or negotiate a truce instead of shooting in first-person shooters. Adventure games are no different in this respect.

The Hobbit exemplifies the linearity of adventure games because, according to Juul (2005), this early graphical text adventure takes the player from scene to scene, limiting the possible actions at one time. The game starts in Bilbo’s house; the first thing the player must do is follow Gandalf. The player can also open a wooden chest or try to talk to Thorin the dwarf, but otherwise there is not much to do there—Thorin does not respond, and the chest is empty. Rather than being linear, the actual issue is that the simulation lacks detail. This lack of nuance could be due partly to technical limitations (it had to run on a Spectrum home computer, with only 48k of RAM), as well as the result from the early exploration of the affordances of digital media. Similarly, in another early game, *Space Quest: The Sarien Encounter* (Sierra On-Line, 1986), the player is thrown into a scene involving one or two puzzles, and cannot move on until they are solved. In both cases, the narrative constraints in the simulation are what makes these games appear linear.

Another aspect that may obscure how adventure games simulate fictional worlds is the pre-design of all possible actions in the game. Computers can simulate well Newtonian physics, city economies, or military planning. Other things are more difficult, such as human-like behavior, or a complex world with multitudinous objects with distinctive functions. The designer must anticipate what players may try and create intelligible responses to these actions—that is the basic strategy to create simulation. The designer needs to select the level of abstraction (Juul, 2007), that is, how much detail the simulation will present. It is a matter of efficiency—there are so many actions that the player can try, but only so many can be programmed; the effort therefore goes into preventing actions that are not feasible. The easiest solution is to lose nuance, instead of creating a system whose complexity increases exponentially by trying to address every single action players may think of. By not allowing actions that may not be possible or useful to solve a puzzle, designers disguise the simulatory characteristics of the world. Contextual actions are a way to prevent these superfluous actions, as exemplified by *Botanicula*, where players figure out what to do through trial and error. Early in the game, the player must retrieve a feather from a hole. The player must choose a character out of five to try to grab it, each one will try something different, and eventually only one is able to get the feather: while the other characters bother the other insects living in the hole, the chestnut-like insect grabs a shell in which the feather was lodged. In contrast, the notorious Babelfish puzzle in *The Hitchhiker's Guide to the Galaxy* requires a contrived set of actions to make a fish land in the player character's ear. Also based on trial and error, this text adventure game requires a larger set of actions afforded by the simulation, increasing the difficulty of the puzzle.

The simulation may be more obvious when the player is dropped into a world to figure out how it works, without time pressure or without the possibility of ending the game prematurely, so the player can explore the world. This is the case of games such as *Loom* or *Myst*. The player has to experiment and test the limits of the system of the game, exploring the world spatially and functionally: How do things work? What happens if I do this? Who is this character? What problem must be solved? By exploring the simulation, the player obtains the information to solve the puzzles and therefore advance in the game narrative. The fact that the puzzles only have one predetermined solution (if they have more than one solution, it is also pre-designed) does not mean that the game is not a simulation.

The Living Dead

"Adventure games are dead" seems a recurring phrase in the discussion of the current state of the genre. The release of *Grim Fandango* is often identified as the dirge for adventure games (Kalata, 2011), while Eric Wolpaw (2000) explains how over-complex and nonsensical puzzle design demonstrates that adventure games committed suicide.

The advent of CD-ROMs may have been partly the cause of the degeneration of adventure games as a commercial genre. *Myst* heralded a new age for adventure games, with high-resolution graphics and sound, and other developers followed suit. In pursuing photorealism, the production costs of these games skyrocketed as they attempted to become more like movies, with rotoscoped animations and long video cut-scenes. The predominance of full-motion video in the second half of the 1990s may have alienated players, who were not impressed by mediocre writing and stilted acting. Adventure games soon became an expensive genre to produce, while the results were cheap movies. By wanting to be like film, developers forgot that these games simulate worlds to be inhabited and explored. Adventure games betrayed their own nature and many players gave up on them.

Adventure games were top sellers in the 1980s and early 1990s, with *Myst* getting to claim the title of best-selling game of all time until *The Sims* (Maxis Software, 2000) surpassed it in sales. Sales charts are now topped by other story-driven genres, such as role-playing games or action-adventure games. Adventure games are not currently considered a successful commercial genre, since they thrive in home computers and mobile devices and there is the biased perception that gaming is console-driven. Justifying the relevance of a genre based on sales numbers or technological platforms demonstrates a misunderstanding of the nature of video game production and consumption, characterizing both as monolithic, homogeneous processes. This misconception is more common in North America, since adventure games have continued to be commercially produced in Europe and Japan.

The genre is very much alive and kicking. Adventure games have been continuously released since the late 1990s, as commercial products and as fan works. There is a plethora of tools available for development, most of them freely available thanks to the dedication and talent of developers who create and foster the communities using them. The current community of interactive fiction exemplifies this continuity: as commercial releases of interactive fiction dwindled, fans created different tools and programming languages to create their own games. The productions of non-commercial developers are notable enough that Montfort's book on interactive fiction (2003) devotes practically half of its pages to them.

The real problem is that commercial adventure games are stuck in a series of aesthetic choices that often shy away from experimentation and innovation. The traits that set them apart from other games have become so predominant they have brought adventure games to a creative stall. Innovation strategies seem to focus more on narrative than actual mechanics, often reveling in nostalgia rather than trying to push the boundaries of the medium. There are also bad design habits that some adventure games designers seem happy to perpetuate, such as illogical puzzles or convoluted plots. In contrast, *Heavy Rain* and *Ghost Trick: Phantom Detective* (Capcom, 2010) represent some of the limited brave attempts to reinvigorate the genre commercially by exploring new interfaces on consoles. The most notable attempts at innovation and experimentation, however, come from non-commercial games. Deidra Kiai's *Life Flashes By* (2010) is a reflection on life decisions from the standpoint of a woman who just had a serious accident, presented as a series of vignettes. Other works feature innovative complex dialogue systems, such as Emily Short's *Galatea* (2000), or Jens Andersson's *Rorschach* (2007); some others give voices to characters that may be disposable in other contexts, such as the orc Grunk in *Lost Pig*.

Time for a Renaissance

As new technologies such as the CD-ROM may have brought the genre to a lull, new technologies may in the same way be able to revitalize it. Adventure games have been a predominantly computer-based genre throughout, with less frequent ventures in consoles. They now thrive in portable platforms, not only portable consoles, where they are already an established genre, but also touch-screen devices such as smartphones or tablet PCs. Their story-driven nature lends itself to being played for a long time, while the portability allows dividing gameplay into smaller chunks of time, so one can play during a commute or short breaks.

While games featuring a lot of text may discourage some players, particularly in the case of interactive fiction, they may also be attractive to people who prefer reading to playing digital games. Tablet computers and ebook readers seem more accessible to non-gamers, since they already use the devices for other purposes, such as work or convenience. Touch-screens are easier to operate than game controllers, since pointing and sweeping allows operating with the world directly, instead of using complex button presses.

New interfaces also open up the way for new ways of interacting with adventure games. Gestural interfaces have brought about new opportunities for exploring the interactions with the world that characterize the genre: *Heavy Rain* bases many of its interactions on moving the analog stick to imitate a gesture. So far the results have been gimmicky, however, since the design simply substituted hand movements for commands or clicks. The way is open to make gestures expressively meaningful in the games' worlds.

Conclusion

As an essential genre for the understanding of narrative in digital games, adventure games are a referent through video game history. They should not be judged by their faults and weaknesses, but by their achievements. Random puzzles, weak writing, and arbitrary constraints are indeed often found in their design, but there are also brilliant examples of world-building, character development, and witty problem-solving. Adventure games deal more often with topics that are not the typical genre fiction fare common in video games, including court drama (*Phoenix Wright: Ace Attorney*, Capcom, 2005) and historical intrigue (*The Last Express*, Smoking Car Productions, 1997). They are also more successful at incorporating comedy than other digital games, from bawdy comedy (the *Leisure Suit Larry* series, Sierra On-Line/High Voltage/Team 17, 1987–2009) to the battle of wits in *The Secret of Monkey Island*.

The richness of the genre provides insight into the struggle to bring narrative and gameplay together. The changes that the genre has gone through over the years are prime examples of the tension between letting the player explore and experiment in the world, and creating a satisfying narrative experience. Interactive fiction has a wide range of actions, which allow players to experiment at large, but players unfamiliar with the conventions of text interaction may get stuck trying to find the exact way to express what they want to do. Facilitating interaction by providing command menus or limiting the actions loses the nuances of the simulation, which encourages free interaction. This basic tension also happens at the level of the narrative: a more complex story usually involves limiting player actions and possible outcomes while experimenting in the simulation. A more open-ended world may not have a strong player story or structure, but it allows the player to explore the world in more depth. Adventure games cover all the ranges within these limits, demonstrating the tensions and difficulties of reconciling both. The history of the genre is long, and continues on by exploring these issues through new design challenges and novel technologies.

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30

ROLE-PLAYING

Andrew Burn

Playing roles is fundamental to human society and culture. In relation to play and games, it belongs to Caillois's category of mimicry ([1958] 2001): the kind of play in which we behave "as if" (to use Dorothy Heathcote's term ([1983] 1991, p. 149): as if we were someone else, somewhere else, in imaginary bodies, worlds, or identities. In sociological terms, role is central to socialization, to childhood development, and to the playing out of social functions in families and jobs. It is the quotidian dramaturgical process represented by Goffman's "performance of self in everyday life" (Goffman, 1959). However, while the role-play of festival, carnival, theatre, pantomime, *commedia dell'arte*, nativity play, and a multitude of other spectacular forms of mimicry seem opposed to the routinized, invisible nature of social roles, the two are related, and can both serve as analogs for forms of roles we find in digital games and virtual worlds.

The function of role is as ambiguous as the function of play itself. It can be seen as developmental (in childhood), therapeutic, educational, creative, cathartic, political, interrogative, and adulatory. It can also be seen as serving no material purpose whatsoever outside the realm of play, as the great play theorists argue. From a psychological point of view it is no less ambiguous: it can involve the kind of intense emotional commitment required in Stanislavski's System; or it can offer a critical distance from the power-play of social roles, as in Boal's *Theatre of the Oppressed*. It can be light, silly, disposable, and party-like; or profound, sustained, and memorable. It can be the stock masks of Harlequin, Widow Twankey, and Cinderella. It can be the lipstick and high heels of little girls playing mummy, the Lycra suits and rubber muscles of Batman costumes for children, or the scar and glasses of Harry Potter. It can be Hamlet's customary suits of solemn black, or Prospero's magic staff. It can be the fan culture of Japanese cosplay, the elaborate style of punk or Goth subculture, the dress uniform of a regimental dinner, or the doctoral robes of a university professor. Any of these, and a multitude more, could serve as comparisons against which forms of role-play in games might be interrogated.

In the more formal context of theatre, role is historically marked off from the realities beyond the proscenium arch; yet dramatic texts have always played with this apparently impermeable barrier. When Puck and Prospero address us directly at the end of their respective plays, enjoining us to contribute to the final outcomes of the drama, the seal is pricked, and begins to leak a little. And these forms of address, in the second person, delegating some agency to the audience, are perhaps cultural precursors of the profitable confusion of audience and protagonist that characterizes the digital games of our era. Meanwhile, the practice of role-play in modern dramaturgy, especially radical practice in social and educational movements, similarly shifts the burden of role from actor to audience, producing the characteristic of games that Juul has called "negotiated consequences" (2003), in which the "magic circle" of play (Huizinga, [1938] 1955) provides either a safe space for experimentation or a conduit to real-world outcomes.

The idea of role-playing in digital games is inextricably linked to the genre of the role-playing game (RPG); though forms of dramatic action we could legitimately call role-play can be found in other genres of game and in virtual worlds. The next section will briefly describe role in the specific context of RPGs, before proposing three ways to think about role-play in games: mimicry, the semiotics of role-play, and drama theory.

RPGs: A Brief Outline

RPGs, in the strict sense, derive from table-top games such as *Dungeons & Dragons* (*D&D*) (TSR, 1974), which in turn derived its content and narratives from a range of fantasy fiction, including Tolkien's *The Lord of the Rings* (1954–1955). Carr et al. (2006) give a description both of Japanese console-based RPGs, which adapted the character sets, landscapes, and narratives of Western table-top games to the forms familiar in post-war Japanese popular culture (evil corporations, nuclear weapons, and samurai-like urban eco-warriors); and D&D-style Western RPGs, such as *Baldur's Gate* (Bioware, 1998), which incorporated the multi-sided dice of the table-top game into their game engines.

The RPG player will often have a choice about the kind of protagonist he or she will play, whether an anonymous customizable avatar, or the narrative's preset main character, such as Cloud Strife in *Final Fantasy VII* (Squaresoft, 1997). Either way, they will acquire experience points enabling specialist skills as they move through the game. They may be supported by companions with different skills, such as thieves, warriors, healers, and mages. Even in stand-alone RPGs with a single user, players adopting the protagonist role can lead a computer-generated team. These structures result in often challenging, complex games that "tend to prioritize reflection, reading and strategy over pace or spectacle" (Carr et al., 2006: 21).

However, many people's experience of RPGs will be through massively multiplayer online RPGs (MMORPGs). Perhaps the main difference in terms of role-playing is that the multiplayer world precludes the possibility of the player taking on a central, identified role in a core narrative. Whereas in *Final Fantasy VII*, we assume the identity of the hero (with a team of named allies), in an MMORPG such as *EverQuest* (Verant Interactive, 1998), *Lineage* (NCSoft Corporation, 2002), *Anarchy Online* (Funcom, 2001), or *World of Warcraft* (Blizzard Entertainment, 2004), all the millions of players worldwide are each the hero of his or her own story, and so are anonymous in relation to the overarching narrative that MMORPGs typically superimpose. Players choose their own names and develop their own pathways through the game, though the sense of "narrative" and role here may be quite loose. Playing an online game can feel, to new players, like wandering aimlessly around, occasionally killing small animals (gaining points and money), or going shopping for weapons or spells (to spend the money). Nevertheless, in contrast to this quite loose adoption of role, a minority of players can opt, in games such as *EverQuest* or *World of Warcraft*, to dedicate themselves to a more dramatically intense form of role-play on dedicated servers where, with other role-players, they develop complex backstories and characters.

A number of researchers have considered what it is like to enter into online worlds and MMORPGs. Carr et al. (2006), discussing the MMORPG *Anarchy Online*, designated three functions of play in online games: representational play (narrative functions), ludic play (engagement with game elements), and communal play (engagements with communities of players) (Figure 30.1). Taylor (2006) charts the progress of the researchers' avatars through the MMORPG *EverQuest*, exploring the experiences of "newbies," informal groupings of players, formed as "micro-level, short-term network[s]" (p. 42), and guilds, the more formal organization of high-level players. In these various forms of social organization, a number of themes emerge: collaboration and competition, reputation, trust, levels of responsibility accorded members at different levels of the hierarchy, and so on. In fact, of course, many elements of social organization among groups in online worlds resemble those found in the physical world, such as those identified in communities of practice theory: how membership of a group can range from committed, central roles to "legitimate peripheral participation," for example (Lave and Wenger, 1991).

Taylor also engages with a longstanding debate about the relationship between the player's offline and online experience, arguing that the relationship between real and virtual worlds is not clear-cut, and that they can leak into each other. Jensen, studying a sample of *EverQuest* players over time, makes the same argument: that the lives of the players, whether in families, retirement, or unemployment, are in some way affected by their role-play in the game (Jensen, 2012). Neither scholar, however, is asserting a simple argument about deterministic effects of games upon social life. Rather, they are arguing that the relationship is complex: in many ways, games are marked out as separate, imaginary spaces; yet, as Internet researchers have often found, online social interaction is affected by offline lives in certain ways, and vice versa. There are no simple rules here: each case needs to be studied on its own merits.

Figure 30.1 The author's avatar, Nirvano, joining a mission group in *Anarchy Online* (2001).

Mimicry: Avatars and Protagonists

Role-play falls, in Caillois's classification of games, under the heading of mimicry. His discussion of mimicry, indeed, might pass as a discussion of role-play, in its emphasis on masks, disguises, theatre, and acting: "[T]he subject makes believe or makes others believe that he is someone other than himself. He forgets, disguises, or temporarily sheds his personality in order to feign another" (Caillois, [1958] 2001, p. 19).

These processes of mimicry in games take the form of the avatar, and avatar studies have developed substantially over the last decade. Jensen helpfully reviews this literature, identifying a wide variety of themes, such as identity, gender, virtual embodiment, communicative function, and multimodal design, while highlighting the predominance of theories of multiple identity and of representation (Jensen, 2012, p. 351 ff.).

In relation specifically to role-play, an avatar can be viewed in one sense as we would view any other protagonist of a narrative. It has identifying characteristics, principally visual, which locate it in relation to the genre and narrative in which it functions; it has a narrative function, to perform actions that will progress the narrative; it will interact with other characters with different functions, whether collaboratively with "helper" character types, or combatively with antagonist types. In these respects, it may be thought of in terms of Propp's morphology of folktale character types (Propp, 1970). However, more importantly for our purpose, this is a protagonist some of whose agency has been delegated to the player. The dramaturgical significance of this has been noted from the beginning of studies of games and electronic narratives. Laurel (1991) and Murray (1997) both noted, in their seminal texts, what it might mean for a member of a theatre audience to cross the threshold of the stage and become an actor in the drama, as is the case when a player assumes a role via an avatar.

The sense of this is perhaps strongest in those forms of role-play in which an avatar with a defined identity and narrative is available. More recently, this kind of player-character is often distinguished from the kind of customizable avatar of MMORPGs and virtual worlds. However, my argument is that the protagonist figure still operates as the player's representative in the game, and thus fulfills the criterial avatar function. In *Final Fantasy VII*, the player assumes the role of a character equipped with an elaborate backstory, a former friend who has become an enemy, a series of romantic entanglements, and a clear mission, all revealed through textual interpolations or cut-scenes. This experience is powerful for fans who follow the story of the characters with the same dedication as fans of any other media franchise (Jenkins, 1992). It is well-known that the death of the female character Aeris in *FFVII* caused an outpouring of grief among fans worldwide; while studies of fan-forums show how they imaginatively develop the story of the game by writing spoilers, fan fiction, and even poetry (Carr et al., 2006).

The imaginary relationship between player and character can be thought of in relation to longstanding questions about the ways in which readers of literature relate to the fictional characters in the texts they read. The French narratologist Gerard Genette coined the word "focalization" to capture the way in which texts establish narrative point of view, or in Genette's question, "Who sees?" (Genette, 1980). This helps one to think about the relationship between player and avatar-protagonist. In Genette's terms, the perception of the gameworld from the avatar's point of view resembles Genette's category of internal focalization, in which the narrator is restricted to what the character sees and knows. However, multiple narrative structures are at work; narrative information is revealed to the player and avatar by other means, such as backstory, on-screen text, and cut-scene, in which the narrative view resembles Genette's zero focalization, where the narrator knows more than the character.

However, we need additional theories to account for ways in which the player can *act* upon the game through the avatar. In particular, we need to keep sight of the fact that, while games may share many characteristics with literary and film narratives, they are still *games*. We can think, then, about how the progression of the narrative, through character roles, events and consequences, and the temporal unfolding of narrative complications and resolutions, is integrated with the ludic system of the game: the puzzles, missions, point-accumulation, game economies, leveling, and win–lose outcomes. Similarly, we can think about how role-play here means to assume the representational guise of a warrior, elf, mage, or halfling on the one hand; but also to manage a package of quantified assets to play against the game engine on the other. This integration of narrative protagonist and ludic entity is described by Burn and Schott as the Heavy Hero and Digital Dummy in the case of *Final Fantasy VII* (Burn and Schott, 2004).

This double engagement of the player—with the ludic system of the avatar and the narrative properties of the protagonist—is not limited to RPGs, of course. Player engagement with a favorite character can feel like the inhabiting of the fictional entity's persona, while the player is playing the game system at the same time. Playing Lara Croft in *Tomb Raider* (Eidos, 1996) can feel like inhabiting a female protagonist with quite specific dramatized qualities, while at the same playing a platform-jumping device. Playing Harry Potter in *Harry Potter and the Chamber of Secrets* (Knowwonder, 2002) can feel like being Harry Potter and entering Hogwarts while playing a magic bean-accumulating machine (Burn and Parker, 2003). In such cases, text and player jointly contribute to the affective experience of the narrative, and the immersive flow (Csikzentmihalyi, 2002; Carr et al., 2006) of the game. For fans of a particular text or franchise, the game-text is met by the long experience and commitment of the fan, and the motivation to enter the imaginary world and to appropriate or even transform it (Jenkins, 1992; Burn, 2006a).

However, these kinds of imaginative engagements with avatar figures may not accurately reflect the experience of other players in other games. In particular, the avatars of MMORPGs, as we have seen, have no specific identity in relation to a specific narrative. While some argue, nevertheless, that to adopt, modify, and act through an avatar is to enter into a kind of identity play (Talomo and Ligorio 2001; Filiciak 2003), others argue that the avatar here really functions as a kind of non-human companion: an artificial entity who accompanies us on a journey or mission (Jensen, 2012).

The Semiotics of Role-Play

How might we analyze the engagement of the player with the avatar? The analytical approach I propose here derives from the social semiotic theory of Kress and van Leeuwen (1996). They present three overarching metafunctions of any act of communication: the representational (to represent the world), the interactive (to communicate between participants in the semiotic exchange), and the textual (to produce coherent, meaningful sequences). If we apply this to literature and to film, we can treat narrative characters, actions, and landscapes essentially as representations. The interactive function would be the ways in which the reader or viewer is positioned: via address systems (such as first-person or third-person narratives in literature), camera angles, shot sizes, or characters speaking directly to camera (in film).

In games, something different happens. Since some of the character's actions are delegated to the player, representation needs to be seen also as interaction. Meanwhile, the address system of the text changes. Instead of referring to the protagonist as "he," "she," or "I," the text addresses the player as "you," whether literally (as in an on-screen instruction) or figuratively, in a kind of persistent second-person state. In fact, when players talk about the character they are playing, interview data can reveal a kind of pronoun-shifting: sometimes they refer to their avatar as "he" or "she," sometimes as "I," reflecting the double engagement of someone who is watching this digital figure move through the story, and at the same time responding to the second-person address of the game, and feeling as if they are, in some sense, the character (Burn, 2006b).

We can also look at the nature of the actions performed by the player in role as avatar. In reality, these are usually quite limited, needing to be quickly activated by the player with a few keystrokes or button presses. They may involve movement forwards and back, using a weapon, pick-up, and jumping and crouching. Half a dozen or so actions seem very limited if we compare the avatar to a character in literature or film; and we might wonder how they can lead to such satisfying dramatic experiences for players. There are two answers, one ludic, one representational. The ludic clue lies in the linguistic idea of "restricted languages." Halliday (1989) argues that, in the game of contract bridge, though the player is working with a restricted language of thirteen cards and four suits, the possible combinations of these and the elaborate conventions of the bidding process make this a sophisticated and satisfying game. In the same way, the limited set of actions the avatar can perform, in combination with a wide range of quantified assets and interaction with both AI characters and sometimes other human players, makes game-play similarly satisfying and complex. The other answer is what I have called "semiotic amplification." We may just be pressing the "up" arrow on a keyboard, but the rich set of signs on-screen, depicting landscapes and characters, make it feel as if we're teetering, or rushing, or tiptoeing, or climbing, or swinging, or swimming. Though the interface actions are limited, the semiotic amplification is unlimited.

Kress and van Leeuwen also adapt the system of mood in language, following Halliday (1985), applying it to visual media. Just as in language an utterance can be categorized as indicative (a statement), interrogative (a question), or imperative (a command), so narrative stances can be characterized as acts of demand or offer. We might say, then, that narratives in literature or film are *offers*: essentially, they make a narrative statement that we then follow. Games, however, are typically *demand acts*: they ask us questions, and issue commands. These may be literal, linguistic acts: do you want to go down this corridor or that one? Do you want to be a warrior or healer? Or they may be visual acts: a maze confronting us asks which way we want to go; an enemy advancing toward us demands combat.

A social semiotic analysis, then, can reveal how playing a character in a game is different from engaging with a character in literature and film, at least in terms of its semiotic structure and its social meanings.

Drama Theory

As we have seen, games have been considered a dramatic form from the beginning. Frasca, for example, borrowed from the theory and practice of Augusto Boal's profoundly influential work, *Theatre of the Oppressed* (1985), which re-conceives of theater as a form of social critique and intervention by devising conventions allowing social groups to direct the drama, intervene in its progress, and take on roles. Frasca's argument in "Videogames of the Oppressed" is that games offer the same possibility, and he imagines how a game such as *The Sims* (Maxis, 2000) might make it possible for a player to dramatically explore social and political themes through the game (Frasca, 2001).

Also influenced by Boal, drama educators have begun to take an interest in role-play in games and virtual worlds. They have pointed out the resemblances between educational drama, which is based on explorations of role and the shared construction of imaginary spaces, and games that offer similar opportunities (Carroll, 2002). The argument here is that role-work in educational drama can be brought into convergence with young people's experience of digital games. Both forms raise questions of identity: of the imagined identities that people adopt when in role, and how these might relate to postmodern conceptions of social identity as multiple, provisional, and fragmented. More recently, Carroll has described how the educational drama convention of "Mantle of the Expert," in which roles invest participants with professional skills and qualities needed to solve problems, resembles the principle of epistemic games, which have a similar purpose in education, providing young people with resources to think their way through authentic, real-world problems (Carroll, 2009).

However, while education may often emphasize the more serious connections between role-play and games, a focus on play reminds us that, while it may provide environments for the exploration of social issues and the nature of identity, it is also always ambiguous, as Sutton-Smith has famously argued (1997). While some rhetorics of play in his list make serious claims for play's function as identity, learning, fate, and power, he places last on his list the ancient rhetoric of frivolity: play as essentially pointless. In a recent research project of my own (Children's Playground Games and Songs in the Age of New Media, the Arts and Humanities Research Council's Beyond Text Program, 2009–2011), looking at children's playground play (Willett et al., 2013), we observed many examples of role-play that exhibited this ambiguity, with children wildly oscillating between enactments of parenthood (that seemed to visit social questions of responsibility and familial care), and enactments of zombies, witches, and demonic possession (which seemed quite the opposite). Furthermore, the project provided evidence of the traffic between role-play in computer games and role-play in the playground. In one example, a group of primary school boys were playing games on the playground derived from the hugely-popular *Call of Duty* franchise, in particular *Call of Duty: Modern Warfare 2* (Infinity Ward, 2009). They enacted characters from the game, used lines of dialogue, brandished imaginary weapons, and recapitulated narrative sequences from the game. These observations raised several questions for us, some which have been explored earlier in this essay. What does it mean to play this kind of role? What is the relationship between the player's offline world and their game world? What kinds of social interaction are taking place? And, more specifically in this setting, what is the relation between role-play in the virtual world of the game, and role-play in the rather different virtual world of the playground?

In relation to this last question, we drew on Foucault's influential concept of the *heterotopia* (1984). Foucault argues that, while utopias are unreal and ideal spaces, heterotopias are real and liminal spaces, using examples such as ships, brothels, and cemeteries. In childhood, while the imaginary worlds of children's games (both video games and playground games) are clearly not real in the usual sense, they may be more real for the life-world of the child than the adult utopia, at least at times. There may be times when the imaginative power of zombies and SAS troopers has more of a density, color, and cultural salience than the rhetorics of development, co-operation, and citizenship that dominate the utopian playground. And while some of Foucault's examples of transgressive, liminal spaces of ritual and taboo clearly cannot apply to children's play (brothels being the obvious example), others fit very well: ships (the children built ships of wooden planks), colonies (*Modern Warfare 2*), and cemeteries (zombie games).

Foucault uses a mirror as a metaphor for the relationship between the self and the spaces of heterotopias and utopia, representing split presence, self-projection from a real to a virtual space, a portal between the two, and an interstitial object between utopia and heterotopias. This captures something of the ambiguity and paradox of the virtual worlds and bodies in children's computer games and playground game-play, and their uneasy relationship with the physical playgrounds, bodies, identities, and voices.

There is no space here to develop the theme of dramatic embodiment, both physical and real, though it was important in our project (see Willett et al., 2013, for a fuller discussion; and Boellstorff, 2008, for a discussion of virtual embodiment in *Second Life*). However, I will briefly mention the importance of drama in the game-derived art form of machinima. While this is often conceived of as a media art form closely akin to animation, the dramatic performance of virtual bodies in 3-D worlds involves role-play of another kind, more closely-related to theatre and to the dramatic aspects of film (Burn, 2009).

Finally, the advent of game-authoring tools accessible to users makes it possible for them to design their own forms of role-play. My own work (*Playing Shakespeare*, Arts and Humanities Research Council's Digital Transformations program, 2012) involves young people's game design, most recently in the form of game adaptation of Shakespeare plays in collaboration with Shakespeare's Globe (2012). Here, 13-year-olds design the player-role of Macbeth, embarking on his mission to kill Duncan, spurred on by Lady Macbeth as a non-player-character (Figure 30.2). Here, the creative possibilities of role-play as a dramatic and ludic form are extended into the opportunities provided by design rather than play.

Figure 30.2 Screenshot from Macbeth game by two 13-year-old girls. Player view as Macbeth outside Duncan's bedchamber.

Conclusion: The Ambiguity of (Role) Play

It might be argued that it is in the playground that the impulse begins for the kinds of drama Boal and drama educators espouse. Here, away from adult supervision, children not only work out how to devise imaginary scenarios and roles, to enact and direct them, and to improvise with bodies, language, objects, and the built environment, but also how to connect these kinds of dramatic play with the dramas of the computer games they play. In any case, this example demonstrates what we might call, adapting Sutton-Smith, the "ambiguity of role-play": how it can be committed yet provisional, profound yet superficial, serious yet trivial, engaged yet critically distanced, and consequential yet inconsequential.

In his account of how people use dramaturgical strategies to perform selfhood in everyday life, Goffman cites Sartre's legendary anecdote of the antics of a waiter in a café. He decides that the waiter is simply acting out his role; and he contrasts the relatively fixed roles of adults with the more fluid roles of children:

> The game is a kind of marking out and investigation. The child plays with his body in order to explore it, to take inventory of it; the waiter in the café plays with his condition in order to *realize* it.
>
> (Sarte, [1943] 2003, p. 59)

Clearly, the children in the playground are, as children do, using role-play and their bodies (including the virtual bodies of their game avatars) to explore, investigate, and play. It may be the case that role-play in video games, as in many other forms of adult play (fancy-dress, amateur dramatics, paintballing) legitimizes the continuation into adulthood of that fluidity and space to explore.

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31

SHOOTING

Gerald Voorhees

According to most accounts, *Spacewar!*, developed in 1961 by Steve Russell et al. for MIT's PDP-1 minicomputer, was the first video game. It was also the first shooting game. One of the most notorious, and certainly the oldest, type of video games, shooting games are diverse, diffuse, and much discussed in both public and scholarly circles. After briefly outlining the various forms of shooting games and the many platforms on which they are played, this essay will examine the shooting game's central place in public controversy linking video games to violent crime and its vital role in the growth of the commercial game industry, ultimately suggesting that these two phenomena cannot be disentangled.

The Range and Scope of Shooting Games

Shooting is an action available in many games, too many to all be termed shooting games without the label meaning everything and therefore nothing. However, "shooting games" becomes a more manageable label when applied to games in which shooting is integral to the core mechanic, defined by Salen and Zimmerman (2004) as "the essential nugget of game activity, the mechanism through which players make meaningful choices and arrive at meaningful play experience" (p. 317). Such a notion includes games where a player can decide some combination of what to shoot at, or when and where to shoot. It excludes games in which shooting occurs as a result of another action, such as the creation or placement of units in a real-time strategy game or tower defense game, as well as games that feature shooting as a possible but unnecessary action, as in most platform games.

This still leaves a great number of games that have been played on wide variety of devices in the category of shooting games. As Mark J. P. Wolf's (2012a) sweeping history of first-person shooters explains, contemporary shooting games have roots in electromechanical midway games but have also appeared on mainframe computers (p. 32). Arcade cabinets have hosted and continue to host shooting games, as have most home and handheld consoles, personal computers, web browsers, and mobile devices. Across these many platforms, shooting games are typically labeled using a set of terms that describe either the range of movement afforded to the player, the perspective from which the player views the game, the physical properties of the hardware, or some combination thereof.

Terms that emphasize range of movement include "rail shooters," which move the player through levels on a fixed path and progress only when specific criteria have been met, such as *Time Crisis* (Namco, 1995) and *Area 51* (Mesa Logic, 1995); "run and gun shooters" such as

Contra (Konami, 1987) and *Duke Nukem 2* (Apogee, 1993), which give players control of a character capable of moving freely in two axes; and "fixed shooters" in which a level is played on a single screen and the player's avatar is restricted to one axis of movement, as in *Space Invaders* (Taito, 1978) and *Galaxian* (Namco, 1979).

The physical nature of the game hardware is called to attention by the labels "lightgun shooter," which describes the gun-shaped peripheral device used to gauge the player's aim by detecting light on the screen, a device used by many arcade shooting games and some console games such as *Duck Hunt* (Nintendo, 1984); "vertical-scrolling shooters" that, like *Xevious* (Capcom, 1982) and *1942* (Capcom, 1984), are typically played on arcade cabinets that are taller than they are wide; and "side-scrolling shooters" such as *Defender* (Williams Electronics, 1980) and *Gradius* (Konami, 1985), which are typically played on wider computer monitors and televisions screens.

Nevertheless, as Wolf (2012b) explains, the most prevalent way of distinguishing different types of shooting games is by the player's perspective on the game (p. 570). Shooting games are played from either a first-person or a third-person perspective, but there are more perspective-based labels than these two. "Top-down shooters" such as *Xevious* and *1942*, in which the player is positioned directly above the action, and "isometric shooters" such as *Zaxxon* (Sega, 1984) with a "3/4 perspective" that simulates 3-D graphics, both employ third-person perspective. And "shooting galleries," shooting games in which a player aims at moving targets on a stationary screen, are sometimes played from a third-person perspective, as in *Blood Bros*. (TAD Corporation, 1990), and sometimes from a first-person perspective, as in *Duck Hunt*. In a proper first-person shooter and third-person shooter, the player's perspective is linked to the playable character. On the one hand, "third-person shooters" such as the *SOCOM US Navy SEALs* (Zipper Interactive/Slant Six Games, 2002–2008) and *Gears of War* (Epic Games, 2006–2011) series, typically position the player over the shoulder of the avatar to provide a very clear sense of the avatar's location in the game environment. On the other hand, "first-person shooters" (hereafter FPS), such as the *Doom* (id Software, 1993–2004), *Halo* (Bungie/343 Industries, 2001–2012), and *Call of Duty* (Infinity Ward/Treyarch, 2003–2012) series, position the player from the point of view of the avatar and in this way require a degree of proprioception, or embodied awareness of the virtual space.

However, the FPS exemplifies the importance of the overlap between qualities of perspective and movement in describing shooting games. First-person shooters are also defined by their affordance of "player-guided navigation through a three-dimensional space" (Voorhees, Call, and Whitlock, 2012, p. 7). Hence, those shooting galleries and rail shooters played from the first-person perspective are not typically labeled an FPS. Similarly, the moniker of "third-person shooter" is typically reserved for 3-D games focalized by the player's avatar; scrolling shooters, fixed shooters, and many run-and-gun shooters, which certainly provide a third-person perspective on the action, are not typically labeled as such.

More important than affixing the terminology of these (sub)genres, which may be an impossible task given the overlap between terms, is the sheer diversity and scope of shooting games they represent. Indeed, not long ago, all of the game types discussed above except the first-person and third-person shooters were considered retro or legacy forms. As retro games, fixed and scrolling shooters appealed to players driven by nostalgia, and as a legacy form they were fast becoming irrelevant given the near ubiquity of 3-D gaming. Yet, the recent uptick in independent game development enabled by the increasing viability of non-traditional platforms such as phones, tablets, and web browsers has brought about a renaissance of shooters employing movement mechanics and perspectives not typically seen since the mainstreaming of 3-D graphics in the early 1990s.

Violence and Vitality

Shooting games, particularly first-person shooting games, have been vital to the mainstreaming of video games. As Rehak (2007) notes, FPS games not only feature prominently among the most popular video games ever, but also number among the few games that have become mainstream cultural icons (p. 193). They have played a key role in the popularization of online gaming and game modding, and have had a huge stake in the industry's push for both graphical and thematic realism. However, shooting games are also among the most controversial types of video games and have drawn the most ire from social activists, politicians, and non-governmental organizations concerned with the medium's impact on society. These are not contrary, conflicting claims, but rather a most intriguing and ultimately productive paradox. Nielsen, Smith, and Tosca (2008) describe this situation as the "contested cultural niche" that video games occupy, positioned between a demographic "slide into the mainstream" characterized by increasingly diverse populations of players and the seemingly inescapable perception that they are an unsophisticated, problematic media form (p. 134). I argue that the contribution of shooting games to the normalization of gaming is coterminous with its controversial status and that they are in fact two parts of the same cultural matrix.

Shooting to Preeminence

Shooting games have long been a cornerstone of the culture of and market for video games. As noted at the beginning of the essay, the first computer game, *Spacewar!* was a shooting game. Though it was a commercial failure, the first arcade game, the *Spacewar!* clone *Computer Space* (Nutting Associates, 1971), was a shooting game, as was *Space Invaders* (Taito, 1978), the game credited with launching the golden age of the arcade. And the first home console peripheral was the shooting gallery light gun for the Magnavox Odyssey, which was bundled with four shooting games (the ninth and tenth game cartridges in existence). More recently, FPS games have been instrumental in the growth of online gaming, the emergence of the participatory culture of games, and the push for increasingly realistic graphics.

Shooting games have marked a number of milestones in the development of video game graphics, including the introduction of vector graphics to arcade cabinets in *Space Wars* (Cinematronics, 1977) and the introduction of isometric perspective in *Zaxxon* in 1982. However, the most significant development influencing contemporary game graphics is the use of 3-D representation. While the first 3-D games were the PLATO mainframe shooters *Spasim* (Bowery, 1974) and Maze *War* (Colley, 1974), the DOS-based FPS *DOOM* (id Software, 1993) marked a leap forward for realism in gaming. Unlike the pseudo-3-D afforded by isometric perspective, parallax scrolling, and Nintendo's Mode 7 method of rotating and scaling one of eight image layers (numbered 0 through 7), *DOOM's* game engine supported a fully-realized virtual, Newtonian space with textured surfaces and differing elevations accessible by moving platforms. This was made possible by developments in computer hardware, notably increased RAM capacity and processor speed (Rehak, 2007, p. 189). FPS games continue to push the boundaries of available hardware and are frequently used to test the capacity of a system, a practice driven home by the moniker "*Crysis* benchmarking" which refers to the practice of gauging a computer's processing power based on its frame rate (frames per second) running the FPS *Crysis* (Crytek, 2007) and its sequels (Voorhees, Call, and Whitlock, 2012, p. 11).

DOOM also helped push multiplayer online gaming into the mainstream. While players had been going online to role-play in MUDs (multi-user domains) for some time, *DOOM* allowed players to go head-to-head in a competitive "deathmatch" (Rehak, 2007, p. 189). As Mäyrä (2008) points out, competitive multi-player gaming had long been a mainstay of video games; however, *DOOM* represented both a quantitative and a qualitative change to this practice. Qualitatively, *DOOM* precipitated a tidal shift from predominantly cooperative, player-vs-environment online multiplayer to competitive player-vs-player matches. Quantitatively, *DOOM* and its FPS successors brought a large population of gamers online and in so doing set into motion the decline of face-to-face multiplayer games. *DOOM*, its direct sequel *DOOM 2* (id Software, 1994), and id Software's *Quake* series (1996–2010), its spiritual sequel, preserved much of the face-to-face competition characteristic of arcade games and console games through LAN matches and parties, in which players would connect multiple computers over a local area network. However, it also marked a key shift in the development of shooting games, and video games more generally, by displacing somewhat predictable AI opponents with dynamic, creative human players, which has resulted in multiplayer becoming the most common mode of FPS gaming (Morris, 2002, p. 84). By creating an intense demand for online multiplayer, FPS games helped to make it a standard feature of video games that is now expected of strategy, racing, and sports games, among others.

One other area where shooting games, and the FPS in particular, helped shape the contemporary digital gaming landscape is through their contribution to the participatory culture of gaming. Although the first game packaged with a level editor was the platform game *Lode Runner* (Broderbund, 1983), *DOOM* both introduced game modding to a wider audience and allowed modders a greater degree of depth. This was, in part, because of the move toward greater realism, which made *DOOM* so large that it was more efficient for the game engine files to be indexed and stored separately from WAD files, short for "where's all the data?" (Mäyrä, 2008, p. 111). Yet, the creators of *DOOM* also designed the software's architecture with the aim of nurturing the nascent community of modders who had taken up the cumbersome challenge of reskinning and creating new levels for id Software's previous game, *Wolfenstein 3D* (id Software, 1992) (Nielsen, Smith, and Tosca, 2008, p. 160). The separation of the executable file associated with the game engine from the WAD files meant that the data could be modified and distributed without circulating or compromising the game engine. While modders produced shareware level editing tools for *DOOM*, id Software eventually released the source code to allow even greater customization of mods. Though it would become uncommon to release a game engine's source code, especially in light of the practice of licensing engines to other developers, id Software and other FPS developers such as Valve (known for the *Half-Life* series, 1998–2007) and Epic (known for the *Unreal* series, 1998–2007) consistently package level editing tools with their games. It is now common for role-playing and strategy games to make a level editor available to players.

FPS games have contributed greatly to contemporary video game forms by presenting players with increasingly realistic 3-D gameworlds, offering competitive online play, and enabling creative opportunities for continued engagement with games. Most significantly (and the likely reason there have been few shooters of note in the last 20 years that are not FPS games), 3-D spaces experienced from the subjective perspective of FPS games have become “one of the key interface languages that most gamers today recognize and understand” (Mäyrä, 2008, p. 113). Nonetheless, this also underwrites the logic of the critics of video games. In other words, the very aesthetic elements that are exemplified by the FPS and have helped propel video games to mainstream prominence (technical and social dimensions notwithstanding) are also the grounds upon which games are demonized and denounced.

Taking Aim at Shooting Games

Video games have been reproached in public and scholarly discourse on a number of pretenses (Williams, 2003, p. 542). Arguments that video games contribute to violence have a preeminent place in the pantheon of condemnations. While popular sources of these claims are fairly diverse —politicians and pundits from across the political spectrum, as well as interest groups organized around the family, media, and religion—academic reports linking games to violence tend to originate from behaviorist research applying psychological and cognitive models. In both of these discourses, there is a fairly clear and observable shift in the rhetoric that occurs in wake of the highly-publicized 1999 Columbine school shooting.

Despite their prevalence during the golden age of the arcade, shooting games did not feature prominently in the intermittent public outcries over games in the 1980s and 1990s. Social activism and politic efforts in the 1980s focused, primarily, on the arcades themselves rather than the content of the games that populated them. However, two very public exceptions to this trend, which both generated protest rallies, can be noted: the first concerned the racialized depictions of sexual violence in the Atari 2600 game, *Custer’s Revenge* (Mystique, 1982), and the second targeted the arcade game *Death Race* (Exidy, 1976), in which players were rewarded for driving a car and killing humanoid “gremlins.” Nevertheless, shooting games did have a place in the larger conversation. In a 1982 episode of *PBS’s MacNeil/Lehrer Report* (J. Quinlan, producer), Long Island PTA president and anti-gaming activist Ronnie Lamm asked: “We’ve taken away their guns and holsters and cowboys and Indians, and we’re now giving them a cartridge with the same kind of violent themes. What is this doing to our young people?” Another guest, Rabbi Steven Fink, followed up:

> These games are very different from cowboys or Indians or even children playing soldiers. In those games they emphasize imaginary kind of skills. There’s nothing imaginary about the zapping of space ships or little monsters on the screen. And I think that the ultimate effect of these games is that they will add to the dehumanization and objectification of human beings.

This discussion illustrates both the reasoning from common sense characteristic of the public discourse on games and violence, and the hypodermic model of media effects, long since discredited and abandoned by researchers. It also shows that shooting games were a common target, even if not the most visible one.

This discourse shifted after the Columbine school shooting to reorganize the public conversation around a focus on shooting games (Voorhees, 2012, p. 97). Though there had been a number of other school shootings, none captured public attention, or lent itself so readily to the vilification of video games, as did the Columbine shooting. The discovery that the Columbine shooters, Harris and Klebold, were avid *DOOM* players, and that they had created custom WAD files that resembled the hallways of their high school, directed ire upon FPS games. In the conflagration that followed the shooting, several public figures dominated the public controversy. One notable voice in the conversation was Jack Thompson, a Florida lawyer who had filed a lawsuit alleging that game and movie makers were culpable for the 1997 Heath school shooting. In numerous interviews following the event, Thompson describes FPS games as "murder simulators." Another figure making the interview and talk-show circuit after the Columbine shooting, Lt. Colonel David Grossman (US Army, ret.), offered anecdotal reasoning, based upon the military's use of FPS games, to claim that shooting games train young people to kill indiscriminately. These claims persist, and were raised again in the wake of the 2012 Newtown, CT shooting. While some, most notably Vice President Joe Biden, called for further investigation of the contribution of video games to a culture that celebrates gun violence, others, for instance National Rifle Association spokesperson Wayne LaPierre, pointed the finger squarely at shooting games and called for their regulation.

Additionally, since the Columbine shooting, shooting games have found their way into academic literature on media violence. Most notably, Anderson and Bushman's oft-cited meta-analysis of psychological research (2001), which purports to establish a clear link between violence in games and real acts of violence but actually looked at more studies about television than games, fails to identify any of the television shows or games featured in the 34 studies. Nevertheless, the essay begins by positioning the study in relation to the Columbine shooting, specifically naming *DOOM* as an influence upon the shooters: "Harris created a customized version of *Doom* [*sic*] with two shooters, extra weapons, unlimited ammunition, and victims who could not fight back—features that are eerily similar to aspects of the actual shootings" (2001, p. 353). More recent studies, for instance Bartholow, Sestir, and Davis (2005) and Ivory and Kalyanaraman (2007) actually employ commercial FPS games in their experiment design (though these studies tend to vindicate shooting games as often as they vilify them).

Ultimately, the case for a causal relationship between the representation of violence in games and real violence is not to be found in the empirical research but rather in the theoretical explanations of the data. According to Anderson and Bushman's General Aggression Model (and in the explanations that Thompson and Grossman offer), there are two relevant factors. *Interactivity*, the player's act of shooting rather than passively watching shooting occur, is conceived as a rehearsal for the real thing and considered impactful in the context of the player's *immersion*, or sense of being in the game. As Ivory and Kalyanaraman explain, the General Aggression Model assumes that the causal relationship between games and violence is "mediated by the cognitive, affective, and arousal states induced by dispositional and situational input variables" (2007, p. 536). Of these situational variables, they identify the sense of presence enabled by technological sophistication as vital.

It is well-established in game studies literature that the conjunction of 3-D representation and first-person perspective contributes greatly to a sense of immersion. Summarizing some of the key works examining the use of this perspective in games, Voorhees, Call, and Whitlock draw attention to how the subjective view of the game space facilitates identification between a player and avatar. By minimizing or even eliminating external referents, the first-person perspective functions as an interface that blurs the distinction between the player's "eye," their "I," and the "I" of the avatar (2012, p. 9). While this perspective does not require a 3-D gameworld, realizing a sense of embodiment does. As Mäyrä explains, the 3-D game spaces innovated by FPS games enable multiple forms of immersion: sensorial immersion facilitated by quality moving images and sound, imaginative immersion born of investment in the game character and world that is stimulated by the game's realism and liveliness, and challenge-based immersion induced by "the freedom of movement, the speed and immediacy with which the game environment reacts to one's actions" (2008, p. 108). Together, these three notions of immersion made possible by 3-D game engines facilitate the sense of being there, the feeling of presence that Lombard and Ditton (1997) define as "the perceptual illusion of nonmediation."

It is as a result of this sense of presence that, according the General Aggression Model, video games have a greater propensity to cause violence, and therefore are of more concern than television and film. Similarly, in the public discourses articulating shooting games to gun violence, a (not so) naive equation of the player as the avatar can be understood through the triangulation of identity, immersion, and interaction.

This brings the public outcry linking video games and violence full-circle with the contributions of shooting games to the growth and mainstreaming of the game industry. Shooting games, in their many forms, have always been a mainstay of video games. In the last 20 years, shooting games have also be instrumental—through the popularization of competitive online play, the participatory culture of modding, and the push for realism—in gaming's move into the mainstream. But they are also, in no small part as a result of these attributes, a lightning rod for criticism of the game industry and players. Paradoxically, the graphical realism pioneered by contemporary shooting games is not only integral to the cultural currency of the form (and video games, more generally), but also to its condemnation as a corruptor of youth.

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32
SIMULATION
Seth Giddings

Defining simulation games is a challenge. While most seasoned video game players will have their own idea of what this category of games looks like—and perhaps some favorite examples—these games share no easily identifiable conventions. Classic simulation game series including *SimCity* (Maxis, 1989) and *Civilization* (Microprose, 1991) are easily identified by their bird's-eye—or "god's eye"—perspective, with the player gazing down on simulated territories and their denizens. But this perspective, and its associated interface devices and gameplay, overlaps and blurs with military strategy games such as the *Command & Conquer* (Electronic Arts, 1995) and *Age of Empires* (Microsoft Studios, 1997) series. The category often includes vehicle simulators from *A-Train* (Maxis, 1985), very similar to *SimCity*, to *Flight Simulator* (Microsoft Studios, 1982), quite different in viewpoint and gameplay. If it includes biosphere or evolution simulators such as *SimEarth* (Maxis, 1990) or *Creatures* (Mindscape, 1996), then why not their ancestor John Conway's *Game of Life* (1970)? And, as *Game of Life* began its own life on sheets of graph paper in a university Math department, could non-digital games be included—*Monopoly* (Parker Brothers, 1934), perhaps—or other scientific simulations not intended for entertainment? For many games contain simulations of physics (gravity, friction, collision) but are not thought of as "simulation games."

The closest simulation games have to a defining generic characteristic is their open-ended structure, a "sandbox" format that gives players latitude in experimentation or in devising their own game tactics and goals. Flight and driving simulators, for instance, offer a relative freedom of movement in an expansive virtual environment. In direct connection to scientific and other non-entertainment computer simulation applications, simulation games allow players to test the system, to see what will happen in a particular strategy is adopted, or if certain variables are tweaked. They rarely have a clear ending or winning state—a feature that has led some to argue that they are not really games at all (Juul, 2003). A simulation gameworld is what Mimi Ito calls "a structured space of possibility" (Ito, 1998, p. 303). This is, for example, a feature downplayed in first-person shooters, but is central to the expansive urban environments and action of the *Grand Theft Auto* games (Rockstar, 1997).

To add to the confusion, many game scholars would argue that *all* games are simulations regardless of their generic categorization or the presence of the Sim-prefix in their title. For Espen Aarseth, "the computer game is the art of simulation":

> Simulation is the key concept, a bottom-up hermeneutic strategy that forms the basis of so many cognitive activities: all sorts of training, from learning to pilot a plane to learning to command troops, but also the use of spreadsheets, urban planning,

> architectural design and CAD, scientific experiments, reconstructive surgery, and generative linguistics. And in entertainment: computer games. If you want to understand a phenomenon, it is not enough to be a good storyteller, you need to understand how the parts work together, and the best way to do that is to build a simulation. Through the hermeneutic circle of simulation/construction, testing, modification, more testing, and so forth, the model is moved closer to the simulated phenomenon.
>
> (Aarseth, 2004)

So, as well as shedding light on the specific conventions and pleasures of simulation games as a category, the complicated and contested term *simulation* goes to the heart of what computer games and video games are, and the ways in which they articulate ideas, processes, and phenomena between their virtual worlds and the actual world. As Aarseth argues, simulation organizes, communicates, and enacts knowledge and events quite differently from the long-dominant cultural modes of mimesis and narrative. This raises a thorny question: how, and what, do simulation games *simulate?* Or, as we'll see, whether they necessarily simulate *anything* at all.

My first encounter with a "god game" was in the early 1990s, with *Populous* (Electronic Arts, 1989), running on a friend's Commodore Amiga. I was enchanted not only by the (for the time) lush and detailed graphics, but also the sense of a dynamic, complex world unfolding on the screen, beyond the edges of the screen, and—importantly—semi-independently from the actions of the player. As I remember it, my friend directed his tribe to doggedly conquer surrounding lands and other tribes, but this action was effected not through the precise control of individuals or groups of individuals, but through his broader instructions and directions. Deploying an approach now familiar to simulation and strategy games, but then (to me at least) utterly novel and charming, we could issue instructions (for colonization, assault, construction, etc.), leave the game for hours at a time, returning to see what had happened in this autonomous microworld in the meantime.

The *SimCity* series epitomizes some key aspects of computer simulation in general as well as computer simulation games in particular. Unlike *Populous*, with its fantasy setting of gods and conquest, *SimCity* appeared to divert the scientific world of computer simulation into entertainment, as urban planning, policy, and management were transformed into extremely popular gameplay. Like *Populous*, it has a god's-eye viewpoint and a dynamic, semi-autonomous world. It is this latter feature that closely connects games with non-entertainment computer simulations: the computer can handle and articulate a range of dynamic variables on the fly, beyond the capabilities of the human brain. Thus, the simulated city is the product of interactions between zoning, infrastructure, taxation, public works and spending, policing, and so on. The player then experiments with these variables, finding optimum relationships between, say, raising taxes (upsetting the citizens, or Sims) to spend on police (reducing crime and appeasing the Sims). If the experiment fails, the player can reset the game, or rewind to a save point and try different tactics and different relationships. This is not far from a computer science understanding of (instrumental not entertainment) simulation: "Rather than simple computing, the solution to a set of equations, a simulation produces a *synthetic history* of the process. Beginning with a set of initial conditions, the simulation plays through the various kinds of events which might occur" (Principia Cybernetica Web; *my emphasis*). Or as Mark J. P. Wolf has put it, simulation is the "embodiment of a theory, it can document what *could be*, *would be*, or *might have been* […] Thus the simulation documents possibilities or probabilities instead of actualities" (Wolf, 1999, p. 28). As we'll see later, we could add to these synthetic histories phenomena that *couldn't be*, but are experienced as if they *could be*.

As noted, god games (or mayor/planner games) are characterized by their presentation of an expansive territory: they look like maps, but maps that are animated, temporal. Ted Friedman argues that games such as *Civilization* and *SimCity* are maps-in-time:

> Representing flux and change is exactly what a simulation can do, by replacing the stasis of two-or three-dimensional spatial models with a map that shifts over time to reflect change. And this change is not simply the one-way communication of a series of still images, but a continually interactive process. Computer simulations bring the tools of narrative to mapmaking, allowing the individual not simply to observe structures, but to become experientially immersed in their logic.
>
> (Friedman, 1995)

Gonzalo Frasca has explored the notion that simulation marks a break from the narrative and representational underpinnings of longer-established media, from the novel to cinema. For him, the salient concept is not Friedman's space-time but the modeling of behaviors:

> [T]o simulate is to model a (source) system through a different system which maintains to somebody some of the behaviors of the original system. The key term here is "behavior". Simulation does not simply retain the—generally audiovisual—characteristics of the object but it also includes a model of its behaviors. This model reacts to certain stimuli (input data, pushing buttons, joystick movements), according to a set of conditions.
>
> (Frasca, 2003)

I will return to both behavior and models/systems. For now, I want to note the significance of the *dynamic* and non-linear nature of computer simulation. Let's explore the implications of this emphasis through two case studies. The first returns us to the worlds of *Civilization*, the second to a less obvious choice, the Nintendo DS game *Lego Battles* (TT Games, Warner Bros. Interactive & LEGO Group, 2009).

Civilization has proved a popular and productive object of study for game scholars. Frans Mäyrä summarizes and synthesizes key arguments in his book *An Introduction to Game Studies* (Mäyrä, 2008; see also Tyler, 2007). The game's canonical status within game studies is not only due to its popularity and success as a game, but also, Mäyrä suggests, with the resonance of its political and historical themes. The game invites the player (or players, in multiplayer versions) to collude with it in simulating world history through expansion, colonization, and the exploitation of the natural world. There is by and large a consensus amongst these *Civilization* scholars that the game is structured around an ideologically dubious model, more or less steeped in a Western narrative of history as driven by conflict, technological progress, and domination. These debates get particularly interesting when they ask whether these ideological aspects actually *matter*. First, whether and in what ways an ideological framework might be reinforced and transmitted through the playing of the games. The ideological workings and effects of popular screen media, particularly cinema and television, have been discussed and argued over since their inception, but, game scholars ask, does the interactive and simulational character of the computer game demand that we rethink the workings of signification between players/viewers and screen images and dramas? Second, in what ways might the simulational form of the video game demand a different way of thinking about the machinations of ideology itself in contemporary digital media culture? This second question has itself been addressed in a number of different ways. Mäyrä summarises David Myers's argument that it is a mistake to understand games such as *Civilization* as representations of politics and history in the first place. In a move familiar in game studies, Myers asserts that the symbolic or narrative elements of *Civilization* as a media object are secondary to the abstract configuration and values of the game structure. For the experienced player,

> [t]he factories, fossil fuels and nuclear power plants no longer refer to their real-world referents. Instead, the "aesthetics of play" will provide each element a new gameplay-related value that is completely independent of the history books that *Civilization* might ostensibly appear to be simulating.
>
> (Mäyrä, 2008, p. 99)

Discussions of the meanings and implications of other simulation game series, notably the *SimCity* and *The Sims* games, have followed similar lines. *SimCity*, it has been argued, presents North American urban development and capitalist economics as a given. For Stephen Kline, Nick Dyer-Witheford, and Greg de Peuter, *The Sims*, with its suburban world of home-building and decorating, teaches its players

> that one must negotiate the daily events and crises occasioned by a life in which commodity consumption is the *raison d'être*. Although the game is open-ended and has no explicit definition of winning or losing, it is not devoid of structure. That structure is provided by getting and spending ….
>
> (Kline et al., 2003, p. 276)

It should be clear that the player's accumulation of virtual worldly goods is a quite different media experience from watching a film or TV program that portrays drama within the material comfort of middle class suburbia (Australian soap operas spring to mind). The game is in itself a dynamic economy or market that must be played, manipulated, and experimented with. In Frasca's terms, this is the *simulation* of acquisition not (or not only) its *representation*. This returns us to the key point: does this new mechanism for engaging media audiences with ideas, dramas, action, processes, and characters imply a tighter ideological grip than that of pre-simulational media? That is to say, is the player of *The Sims* more thoroughly seduced by the appeal and logic of consumer capitalism (or the *Civilization* player by the appeal and logic of geopolitical dominance) because of their immersion and investment in dynamic models of these systems? If so, then the relationship between the game simulation and the system it models becomes a significant cultural-political object of inquiry. Making a direct comparison with the military's adoption of video game software for combat training, Kline et al. argue that *The Sims* is a "civilian simulator training for yuppies" (Kline et al., 2003, p. 276).

From this perspective, it matters whether *SimCity* allows its players to experiment with alternative economic or social systems, whether, for instance, the flexibility of the gameworld makes possible synthetic histories (or synthetic futures) that explore sustainable or collective economic and social organization. Or we might address this issue from a different direction: the open-ended "sandbox" structure of simulation games encourages a range of possible playing styles, strategies, and outcomes, and players might find their own alternatives beyond those anticipated by the games' designers. Even Kline et al.'s pessimistic reading of the politics of video games recognizes the possibility that players might "subvert symbolically" the digital capitalist logic of the Sims as simulation.

While they argue over the mechanisms and implications of simulation as a media form, these video game scholars assume a fundamental connection between a source system and its simulation, between the city and the SimCity. The video game scholar is then susceptible to "simulation fever," Ian Bogost's useful, and playful, diagnosis of anxiety about the relationships between virtual and actual systems: "The nervous discomfort caused by the interaction of the game's unit-operational representations of a segment of the real world and the player's subjective understanding of that representation" (Bogost, 2006, p. 136).

To ameliorate the symptoms of simulation fever, let's return to the idea that the representational elements of a video game are, once the game is in play, secondary to the abstractions of its rules, structure, and gameplay. What if this idea were taken further: that simulations needn't simulate anything, that they are dynamic systems in their own right whose representational/modeling aspects are incidental or residual, that they are not copies of something else. To explore this idea, we might look at these systems as *computer* simulations, as informational and procedural systems for practical ends rather than *games* for popular entertainment. Computer simulations model space, time, and dynamic nonlinear systems. They are algorithmic and mathematical and so any behaviors they model, from weather systems to economies, must be processable and expressible in mathematical terms. This in itself opens up a gap between any model and its putative source system. For example, Mitchell Resnick's *StarLogo* (StarLogo TNG, 2008) program is designed to allow children to experiment with various kinds of bottom-up emergent behaviors. *StarLogo*'s simple cellular automata (called "turtles" but presented as points on the monitor screen), can be variously figured as traffic jams, slime moulds, or termite colonies. To play with them is to generate knowledge that is not representational (it isn't specific knowledge about the actual systems of insect colonies or traffic flows) but simulational (knowledge about the dynamism of the simulation as a nonlinear system). As Resnick puts it,

> The real world serves only as an inspiration, a departure point for thinking about decentralized systems … I am more interested in investigating antlike behaviors than the behaviors of real ants … The goal is not to simulate particular systems and processes in the world. The goal is to probe, challenge and disrupt the way people think about systems and processes in general.
>
> (Resnick, 1997, pp. 49–50)

Here then the simulation simulates *nothing* in the actual world—it doesn't aim to accurately simulate traffic jams and slime moulds; rather, it uses these artificial and natural phenomena as cues for grasping the workings of dynamic systems in general. As Mark J. P. Wolf points out, simulations don't require data from the outside world to operate, they can be "used to image real or *imaginary* constructs, or some *combination* of the two" (Wolf, 1999, p. 280). And so the attenuated connection with actual world systems is broken (see also Giddings, 2007c).

Cellular automata are paradigmatic here, a kind of simulational stem cell. Conway's *Game of Life* has been mentioned already. The scientists who first translated Conway's paper grids and pebbles into computer code were entranced both by the possibilities of modeling complex emergent behavior from simple rules for understanding actual biological processes, and by the new artificial systems and behaviors the program generated. The principles of cellular automata drive games from *SimCity* (see Ito, 1996), to war sims (Giddings, 2007b), and back to biological evolution in games such as *Creatures* (Kember, 2003).

So the question "what do simulation games simulate?" can be answered three ways: Answer 1 is "not always what we might first think"; Answer 2 is "nothing"—or rather something imaginary and hence "nothing actual"; Answer 3 is simply "they simulate themselves."

The apparent paradox of Answer 3 resonates with philosophies of simulation and artifice, philosophies that can be dated back to questions of the nature of reality and artifice in classical antiquity. In recent decades, and in response to contemporary media culture, the simulation is "a copy of a copy," or "a copy without an original." The three answers above echo Jean Baudrillard's stages of the precession of the simulacra (Baudrillard, 1983—for detailed discussion of the relationships between simulation as a critical concept and as a technocultural form, see Lister et al., 2009, pp. 38–44; and Giddings, 2007c).

Some video games are particularly vivid illustrations of this notion of simulation as procedural and as a model of nothing in the physical world. The Nintendo DS game *LEGO Battles*, for instance, demonstrates the self-referential character of much of contemporary media culture. It offers three different fictional worlds—with pirate, castle (medieval knights and kings), and space themes. Each of these fictions is a copy of a copy, not of any historical reality. The pirates are the eye-patch wearing and cutlass wielding romantic figures familiar from theme parks, children's literature and film, the knights inhabit a world of magic derived from broad generic tropes in medievalist/fantasy culture, and the spacemen from the speculative realms of science fiction. Moreover, of course, they are all copies of actual LEGO sets, virtual copies of toys that are in turn drawn from archetypes from the diffuse semiotic realm of popular children's culture. The gameworlds are permeable too, so the player can set up fights between, say, spacemen and pirates. The openness of simulation as a space of possibility here opens onto the phantasmagorical nature of popular culture and children's play (Sutton-Smith, 1997). It models a world, but a world of its own making.

As a computer simulation, *LEGO Battles* is similarly promiscuous in its referentiality. It borrows its top-down perspective and exploration/combat gameplay mechanic from simulation games in the tradition of *Populous* and *Civilization*, and their close relatives, turn-based games and real-time strategy games. Again, the artifice and conventionality of the simulation presents itself over any reference to actual world systems. If we can still argue that *Civilization* meaningfully simulates history and geopolitics, then it is impossible to see *LEGO Battles* as simulating anything actual although it uses very similar mechanisms and processes, and offers similar gameplay challenges and pleasures.

By their very nature, the workings and effects of open-ended play and bottom-up emergent artificial systems (from *Game of Life* to *SimCity*) cannot be predicted by simply analyzing the rules or software. Their conventional, subversive, or simply ludicrous possibilities are only realized in events of play. As Mimi Ito puts it, the closure of video games "is constantly subverted by unexpected refractions and recombinations, unorthodox identifications that threaten the containment of the microcosm. This analysis is driven by these suspicions of recombinant meanings and unforeseen interlocutions with a virtual imaginary" (Ito, 1998, pp. 301–302).

Ethnographic studies demonstrate anticipated, "preferred" play, but also all kinds of phantasmagorical action and recombinant meanings, events that cannot be contained by the microcosm of the gameworld. In a move familiar to *Sims* players, a friend's daughter repeatedly removed the steps from her Sim family's swimming pool. Unable to leave the water, the characters die. This is in itself is an example of emergent behavior (at least on the part of the players—it is not clear if this is a possibility intended by the game designers), however, it transpired that the young player was not so much destroying her Sims as exploiting a game feature to create ghosts. She had built her house near the virtual graveyard for precisely this purpose. Ito's study of one boy's playing of *SimCity 2000* (1994) charted the interplay of cheat codes, the player's preference for destruction and disaster over (educationally validated) construction and planning, and the role playing of an "evil warlord." Whatever the intentional or unintentional politics of *SimCity* as a simulation, as a piece of soft technology in everyday life it can be put to quite different political ends (Ito, 1996; for accounts of phantasmagorical play with video games, see also Giddings, 2007a, Weber and Dixon, 2011; and Kember, 2003).

These games are computer simulations at the service of entertainment. They offer experimentation with settings and variables, and encourage reflection on the dynamism and processes of their worlds and economies. Yet, one of the great pleasures of simulation play is the generation of unexpected, emergent events within the world. The "sandbox" tag neatly brings together the mapping and totalizing viewpoint of the war room with the child's free play with sand and water. In this sense, simulation games are at once the most ideological and the most creative video games.

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33

SPORTS

Andrew Baerg

The sports game genre has played an important role in video game history. Some of the most important video games in the medium's past, Ralph Baer's Magnavox Odyssey games and Nolan Bushnell's *PONG* (1972), are based on sports. Sports video games have also been among the most profitable game genres (Crawford, 2005b) and continue to occupy a vital place in the development of the industry and the medium. Yet, in 2006, critical cultural studies theorist, David Leonard, could assert that academic attention to the sports game genre represented "a barren wasteland of knowledge" (p. 393); sports game studies were essentially non-existent. Since that time, scholars have slowly begun to cultivate this wasteland.

This essay on the sports game genre examines the seeds of growth that have developed as a result of this cultivation. The ensuing sections address existing work on the types of sports games, textual analyses of games in the genre, sports game player studies, and industry studies. Because so little research has been done on sports games, this chapter not only outlines the existing scholarship on the genre, but also establishes areas that could be explored in considerably greater depth.

Game Types

Conway (2007) has divided the sports game genre into three sub-genres: management simulations, extreme simulations, and action simulations. Kayali and Purgathofer (2008) dispute the notion that sports games are restricted to the category of simulation. To simulation, they add the categories of abstraction and transformation. However, they acknowledge that their discussion is loosely based on Conway's work (2007).

First, management simulations attempt to simulate sport by focusing predominantly on realistic statistical outcomes. Photorealistic graphics remain a secondary concern for developers and players in this sub-genre. Many management simulations feature comparatively rudimentary graphics, if they have graphics at all. This sub-genre has its roots in the card-and-dice based sports board games of the mid-twentieth century (Baerg, forthcoming 2013). Although there are a few exceptions, most management simulations have users play as general managers or coaches. Users rarely, if ever, take direct control of individual virtual athletes. As such, the focus of gameplay within this sub-genre is on tactical acumen and decision-making. Strategic planning in the management simulation may occur in the short term as part of individual games, but greater emphasis tends to be placed on longer term choices that shape a user's experience across multiple seasons (Conway, 2007). Examples in this sub-genre include annual versions of the

Football Manager (Sports Interactive, 1992–present) and *Out of the Park Baseball* (Out of the Park Developments, 1998–present) series.

Unlike management simulations, the second sub-genre of extreme simulations dismisses realistic statistical outcomes almost entirely. Whether a team or athlete should succeed or fail, based on expectations from real-world performances, is next to irrelevant in this category. The effect of numbers on gameplay tends to be deemphasized in favor of a user's skill in reacting quickly to different in-game situations. This need for fast reflexes is furthered by the extreme simulation's tendency to stretch the laws of physics. Athletes in this sub-genre can run faster and jump higher than their real-world counterparts and can subsequently perform exaggerated stunt-like sports maneuvers as a key part of gameplay. The earliest versions of extreme simulations appear with games such as Epyx's *World Games* (1986) and *California Games* (1987) and skateboarding titles such as *720* (Atari, 1986) and *Skate or Die!* (Electronic Arts, 1987). Popular examples of the extreme simulation include *NBA Jam* (Midway, 1993) and the SSX (Electronic Arts Canada, 2000, 2002, 2003, 2005, 2012; Electronic Arts Montreal, 2007, 2012) snowboarding series.

The third and most popular sub-genre of sports games is the action simulation. Action simulations represent an attempt to unite the quantitative realism offered by the management simulation with the direct control offered by extreme simulations. Users subsequently guide athletes on virtual playing fields while generating plausible statistical results. Action simulations are committed to a visual fidelity when it comes to modeling athletes, their respective uniforms and equipment, and the stadia in which they play. This visual fidelity is supplemented by an emphasis on televisual styles of representation. Action simulations feature various camera angles through which users can experience gameplay. Sports games in the action simulation category include the now annual iterations of the *FIFA Football* (Electronic Arts Sports, 1993–present), *Madden Football* (Electronic Arts Tiburon, 1993–present), *NHL* (Electronic Arts Canada, 1991–present), and *NBA 2K* (Visual Concepts, 1999–present) franchises.

As with the division of the genre into sub-genres, so too can the research on sports video games be divided into three areas. The following sections engage work done on the sports game text, the genre's players, and the industry's practices.

Textual Studies

Existing textual analyses of sports video games continue to be few and far between. Those studies that have been published have tended to adopt a critical cultural theoretical approach as a way to engage a given game's ideology.

Leonard (2004) adopts critical race theory to suggest that sports video games invoke discourses of white, masculine heterosexuality. In doing so, they provide a twenty-first-century parallel to nineteenth-century minstrelsy. Leonard argues that the overwhelming majority of black males in video games exist as athletes. Given this fact and given that the most sports game players are white, Leonard asserts that the sports video game's primary pleasure is located in enabling white players to participate in the fantasy of becoming black. Like nineteenth-century minstrels, sports video games allow white players to put on the black other and to engage an imagined form of blackness. As a consequence, the sports video game becomes a site where white hegemony is consistently reinforced.

In his textual analysis of the boxing action simulation, *Fight Night Round 2* (EA Sports, 2005), Baerg (2007) takes the issues of hegemony in a different direction. Rather than concentrating on race and hegemony, Baerg attends to the issue of gender and hegemony through an examination of the virtual boxing body. Baerg argues that the mediation of the boxing body via the game's gendered avatar construction process and the camera angles that are deployed during ludic segments reinforces a hegemonic masculinity associated with physicality and violence. This form of masculinity is also furthered by a patented control system entitled "Total Punch Control," an interface that emphasizes attacking movements at the expense of defensive maneuvers. As with Leonard's (2004) minstrelsy, resisting the game's hegemonic masculine ideology is nearly impossible unless the game is not played at all.

Cree Plymire (2009) also examines how sports video games generate a specific relationship to the body. Cree Plymire turns to Bolter and Grusin's (1999) concept of remediation and its associated notions of immediacy and hypermediacy to argue that an important aspect of the success of the *Madden Football* franchise derives from its commitment to remediating televised broadcasts of football while simultaneously rendering these broadcasts irrelevant through its affordance of interactivity. Cree Plymire goes on to assert that this remediation fosters a posthuman subject position in which players potentially have a sense of embodiment subsumed as they play. Without this embodied sense of self, a politicized embodiment becomes increasingly tenuous. The avatar problematically becomes more important than the real-world body of both athlete and sports game player.

Where Leonard's (2004), Baerg's (2007), and Cree Plymire's (2009) textual analyses concentrate on ludic aspects of sports game texts, Conway's (2009) essay on soccer game start screens extends textual analysis beyond gameplay and into the nondiegetic sequences involved in the experience. For Conway, examining the first representation of a given sport upon booting up the game provides a way to understand the nature of sport and its accompanying ideologies in new media. This representation involves both visuals and sound. In working through various introductory videos and start menus from soccer games in the categories outlined above, Conway asserts how these nondiegetic aspects of sports video games become important for the way they position subjects, invoke particular aspects of sport culture and engage a "broader sporting ideology espoused by the global media-sports complex" (2009, p. 68). As such, these opening sequences become as important for communicating ideology as the explicitly diegetic sequences.

Baerg (2011) considers another nondiegetic aspect of the sports video game text by turning to the significance of the quantitatively-based player rating system. In the action and management simulation, the player attribute rating system sits at the core of gameplay by providing numbers for a given athlete's ability across a range of categories. Rating systems in sports video games exist as classification systems with ideological implications. By combining theory on classification systems and applying it to the rating system at work in *FIFA Football '09* (Electronic Arts Canada, 2008), Baerg examines how the game's player attribute ratings system enables comparability between players in the system, renders visible a specific vision of what constitutes a football player, and allows for control of both the population of football players at a macro level and specific players at a micro level. Through the lens of these three dimensions of the system, player attribute ratings in sports video games foster a quantitatively-based instrumental rationality.

Player Studies

The critical cultural approach to the sports game text takes one perspective on the genre. Another perspective shifts from the text to engage the experiences of sports video game players. Garry Crawford has focused most prominently on this aspect of sports video games.

One of Crawford's (2005a) first essays on the subject addressed the relationship between digital games, sport, and gender. The impetus for this project derived from scholarly and popular concerns expressed by those who believed that sports video games were causing young people to move away from participation in real-world sport. Crawford's project found that playing sports video games did not adversely influence real-world sporting activity. In fact, the opposite was true. Data revealed that playing sports video games fostered social interaction around sport. This social interaction, in conjunction with sports game play, generated further knowledge and attraction to the sports being played. As a result, sports video game play increased the possibility of real-world sport participation. This finding was affirmed by an additional study in which Crawford (2005b) concentrated on how players used sports games to construct identities and knowledge communities around their game play. In both projects, Crawford noted that this participation in sports games and its ensuing social interaction was clearly gendered male.

Crawford (2006) extended this previous work to focus on the pleasures players received in playing sports video games and the relationship of these pleasures to real-world sport. In this study, he used interview data to investigate the enjoyment gained by players of the *Championship Manager/Football Manager* (*Championship Manager* became *Football Manager* in 2004) management simulation. Data from this study revealed how deeply digital games could become embedded in the lives of their players. For Crawford's subjects, *Championship Manager/Football Manager* served as a social lubricant framing a considerable amount of interpersonal communication away from the game. Players would frequently discuss their experiences in the game in deploying it as a conversational resource in their everyday interactions. Crawford also found that this experience of the game would also be woven into conversations about real-world football as well. *Championship Manager/Football Manager* effectively became intertextual in enabling an easy shift from game to professional football and back again.

In Crawford's fourth essay (2008) on sports game players, he detailed the differences between the reception and success of sports films and sports video games. He noted that sports video games have been much more financially successful than sports films. He theorized about this gap between the two media by turning to Ricoeur's notion of "narrative identity." Narrative identity speaks to the stories told by the self about the self and stories told about the self by others. Crawford used this theory and applied it to interview data gathered from sports game players to suggest that sports video games offer players a way to actively create narrative identities in ways that films do not. These narratives can be used to project the self into the club being controlled in the game and subsequently into the real-world club that players support. Crawford and Gosling (2009) affirmed how the narratives emerging from sports game play could be deployed for constructing player identity and social performances as sports fans.

Baerg (2008) addressed another dimension of player interaction with the sports video game in examining how *Madden Football 2005* (Electronic Arts Tiburon, 2004) players understood notions of realism. His study of sports gamer message board discourse revealed how this community desired a visual realism oriented around graphics and plausible animations and a quantitative realism oriented around statistically plausible outcomes. To achieve this perceived realism, the players in his data set established scientifically-oriented processes enabling them to experiment with the tools provided by the game. By manipulating in-game sliders, *Madden Football 2005* fans were working collectively to achieve consensus on what they perceived to be the most realistic version of football the game could offer.

Industry Studies

Although sports game texts and players have received some attention, next to nothing has been written about the industry side of sports video games. To date, Paul (2012) has provided the only extensive look at the production and economics of the sports game. Paul's primary argument suggests that the sports video game operates from the economic foundation of planned obsolescence. Paul argues that planned obsolescence exists as an important aspect of the development and marketing of the sports video game.

On the development side, sports games began the practice of an annual release schedule, a schedule that has been mimicked by the *Call of Duty* (Infinity Ward, Treyarch, 2003–present) franchise. Paul asserts that the sports game's annual production schedule means that a game's initial release is followed by the promise of improvements to next year's game. Developers working on sports games must generate creative ways to differentiate the following iteration of the series from existing games. The short development cycle also means that the entire process of programming from conception to completion must occur in an extremely tight window. That could mean considerable pressure on a development team. However, if developers can come up with a few new features for the next version of the game, it may not matter if these features succeed or fail. The strategy of planned obsolescence means that there will usually be another opportunity to build on a successful change or quickly move in a different direction. This strategy is further protected by exclusive licenses.

Not only does this planned obsolescence shape the development of the sports game, but Paul also argues that it necessarily influences the nature of sports game marketing as well. A massive marketing effort must be mounted each year to ensure that customers both notice differences between the old game and the new game and see these differences as significant enough to warrant another purchase. The new features of each annual release must be endlessly promoted to convince potential buyers that they will be playing the best version of the game ever made. The marketing department's job is simultaneously easier in that new features provide a ready-made narrative they can present to potential customers, but at the same time, the job is made more difficult in that these features may not make a significant enough departure from the previous version of the game, a version released less than one year before.

Sports games rely on planned obsolescence, but they also have begun to rely on exclusive licenses with professional sports organizations. Paul suggests that sports games must maintain team rosters and stadia that are true to life. Without this perceived fidelity, the product is much less attractive to consumers. Electronic Arts began making licensing deals with individual athletes in 1983 and organizations in the 1990s. However, their 2004 licensing agreement with the National Football League, represented something new in making them the only developer who could produce a game using NFL intellectual property. This deal created a ripple effect in the industry and has drawn the ire of commentators and consumers for limiting competition and fostering stagnancy instead of innovation (Good, 2011).

Licenses have also generated other issues for the sports game industry. As of 2012, former athletes have filed ongoing lawsuits against EA for including their likenesses in the game without permission and subsequent compensation. Former Cleveland Browns running back Jim Brown, former college football quarterback Sam Keller, and former college basketball player Ed O'Bannon, have sued EA over their respective rights-of-publicity. EA has responded to their claims by arguing that video games are protected by the First Amendment as creative works (Thomas, 2010; Dodd, 2013). The Keller and O'Bannon cases remain pending and will certainly have implications for the sports game industry.

New Research Directions

Given the very limited work that has been done on the sports video game, considerably more questions can be posed about a genre that is among the medium's most popular and lucrative. Each of the areas described above instigates further investigation.

In recent years, the sports game genre is borrowing from other genres such as realtime and turn-based strategy and role-playing games. By integrating game mechanics such as countdown clocks on free-agent negotiations and individual game modes that have players gaining experience points for their virtual athletes, the genre is beginning to blend into other genres while also opening up questions about how this blending shapes how we categorize sports games. Existing categorizations may also need to be reformulated with the rise of motion-control systems such as Nintendo's Wii Remote, Microsoft's Kinect, and Sony's Move. Although developers appear to have struggled with implementing these systems into sports games, motion controls in next generation of consoles could alter the sports game landscape considerably.

More research can also follow Baerg (2007, 2011) and Cree Plymire (2009) with questions about the mediation of the body in the sports game. The body is crucial to real-world sport, so examining how it is mediated in the sports game ought to remain a concern for research on the genre. What might be some of the consequences, for example, of the sports game's continued reliance on numbers in mediating the body? Both for the mediation of professional athletes, but also increasingly for players who themselves become quantified as their performances are tracked and aggregated? Questions of embodiment and the mediation of the body also arise with motion control systems. How might these systems influence the marginalization of politicized embodiment, if at all?

Paul (2012) also notes a development that could shape the nature of future sports game studies with the increasing emphasis on the online aspect of the sports game. Paul references then head of EA Sports, Peter Moore, forecasting a future in which the off-line game will entirely disappear. This disappearance has been perpetuated by the recent introduction of Facebook versions of *Madden Football* and *FIFA Soccer*. Other versions of these games will extend to tablets and cell phones.

If Electronic Arts, as the dominant sports game developer, should continue move in this direction, new questions will need to be asked about the nature of the sports video game text and the experience players have engaging it. Rather than existing as singular products in a singular media space, an increasing move to focus on online play potentially makes the sports video game a transmedia experience. A game such as *FIFA Football* would subsequently become less of a concentrated game and more of a ubiquitous activity. Clearly, this shift would have considerable implications for the player's relationship to sports game play and to that person's sports fandom as well. If the sports video game becomes a space of experience accessible from multiple locations, does it, in following Cree Plymire's (2009) argument, become an even greater threat to televised sport? Does the sports video game begin to take over from television as the dominant medium of sport? More questions could be asked about the consequences of this shift for players as well. Would the real-world sports knowledge Crawford's (2005a, 2005b, 2006, 2008) interview subjects gained in playing sports games still shape interaction with real-world sport? If the sports video game becomes more interesting than sport itself, at what point is this knowledge still real-world sports knowledge? Crawford's work could also be used as a springboard into questions about the pleasures players would receive from having constant access to the sports game(s) of their choice.

The sports video game has come a long way since the days of the Magnavox Odyssey and *PONG*. Yet, it could be argued that research on the genre remains as sparse as the space between opposite ends of the screens from those games. In spite of being occasionally lamented by gamers, critics, and scholars, the sports game raises interesting questions and will continue to do so in the years to come. One can only hope scholars continue to cultivate this area so that research on sports games will no longer represent a barren wasteland.

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34
STRATEGY
Simon Dor

Strategy games have their roots in wargames. One of the first known war simulations was *Kriegsspiel*, a nineteenth-century board game made by a Prussian lieutenant in order to depict combat situations, as opposed to chess, in which the war theme is merely symbolically represented by the pieces (Egenfeldt-Nielsen, Smith, & Tosca, 2008, p. 46). There are different tendencies in today's strategy games, some inherited from their wargames history, while others are inherited from sports and competition games.

For contextualization purposes, a general history of video games is crucial, and a genre history is also of primary importance. However, a thorough history of the strategy genre is still to be written—especially when it comes to the emergence of the genre. Analyzing a strategy game does not necessarily consist of understanding its mechanics and assuming that they are an ideal representation of how the game is played since its release date. The history of the game itself as a cultural object, and thus the history of its strategies, can be of major importance in understanding its place in the history of video games. In other words, analyzing a strategy game is examining in detail how it is inscribed in the "history of *interactivity*," to use Henry Lowood's expression (2004, p. 6). Analyzing a game can also imply studying its playing habits and its strategies at different historical moments, using archived gaming sequences, reviews, strategy guides, etc. The history of strategies of a video game, a group of video games, or a genre can be done using two different and complementary paradigms of archiving: exhaustiveness and meaningfulness.

Common Considerations in Strategy Games Studies

Every game that necessitates cognitive skills and long-term decisions could technically be considered a strategy game. Usually, however, strategy games refer to military-themed computer games where the player takes the role of a commander and needs to gather resources to summon new military units. Strategy games are divided in two branches: turn-based strategy (TBS) and real-time strategy (RTS).

One of the first games in the field of strategy is *Hamurabi* (Circle Enterprises, 1978), a text-based game where the player manages a state's population by growing and storing food, using "text printed out on rolls of paper" (Donovan, 2010, p. 49) as its only visual aspect. The player had to respond to each game state using a combination of small holes on a paper roll. This turn-based dynamic was used in a lot of 1980s strategy computer games. Real war simulation was common (*Computer Bismarck*, Strategic Simulations, Inc., 1980); science fiction (*Reach for the Stars*, SSG, 1983) and general management (*M.U.L.E.*, Ozark Softscape, 1983) being other frequent themes. TBS games reached their pinnacle with *Sid Meier's Civilization* (MPS Labs, 1991). Some games began to integrate real-time elements at least since *Utopia* (Mattel Electronics, 1981), but RTS games as we know them today emerged in the early 1990s, with *Dune II: The Building of a Dynasty* (Westwood Studios, 1992) considered as one of its most influential pioneers.

Strategy games are typically games of emergence, often offering a single-player campaign that is a series of scenarios to complete in a specific order. Most actions are taken while keeping the possibilities of future events in mind, including an opponent's future moves and one's own. Strategy games often imply a "fog of war," which means that each player's actions are performed secretly, until they are discovered by the opponent's scouts. When starting a new game, the player will choose individual properties: a map with specific obstacles and in different modalities (one-on-one, two-versus-two, cooperative against a computer opponent, etc.). Each TBS playing tends to run for hours, and is often divided into different game sessions. In online multiplayer games, each player will wait for the other to finish their turn. TBS games often feature a "hotseat" mode, letting two or more players play on the same computer, taking their turn alternately on the same screen. RTS games tend to be shorter: playing more than one match in a game session is frequent. Each move must be made quickly since the time to implement a decision is part of the game. The precision of mouse and keyboard controls is preferred for most RTS fans.

Some video games, such as *Lords of the Realm II* (Impressions Games, 1996), use real-time mechanics for combat and turn-based for grand strategy scale and management. Each combat situation is not evenly balanced, since the forces present on both side are not equivalent and depend of decisions taken earlier during the grand strategy phase. These game experiences are, therefore, usually closer to TBS games than to RTS games. In *Rome: Total War* (Creative Assembly, 2004), as in other hybrid strategy games, real-time combats can even be resolved automatically. What is common to each strategy game is the fact that a single match is often only a small part of a longer-term: you can, of course, finish the single-player campaign, yet you never really "beat the game."

There is also a clear distinction between strategy in a Player vs. Environment (PvE) dynamic and a Player vs. Player (PvP) dynamic. The PvE dynamic is usually experienced in the single-player campaign or in cooperative modes; in its most simple enactments, the main goal is to optimize forces by combining different units or by choosing the correct moves. In *Commandos: Behind Enemy Lines* (Pyro Studios S. L., 1998), a video game that uses RTS mechanics in puzzle-solving situations, the player controls a small squad of units and enemies do not have a strategy of their own: they are obstacles rather than a symmetric opponent. If one specific strategy fails, the player can attempt another one in the next try in order to optimize his or her decisions.

In a PvP dynamic, optimization is usually not so simple. Consider the intransitive dynamic of *The Ancient Art of War* (Evryware, 1984), a strategy game using real-time elements. As described by Ernest Adams and Andrew Rollings (2007, pp. 364–365), in most skirmishes, there are only three unit types: in normal circumstances, knights beat barbarians, barbarians beat archers, and archers beat knights, akin to the game *Rock-Paper-Scissors* although with a deeper complexity. Against an army of knights, it would be theoretically possible to use only archers to optimize the engagement. But the player has to know beforehand what the opponent's army composition is, for there could be no knights at all in the next fight. This explains why playing strategy games remains a cognitive challenge of struggling with different potential strategies in mind and a question of scouting—trying to know what's coming next—before it is a question of optimization. Predictability is, then, an important aspect of PvP mode. It implies that players can infer and anticipate what their opponent(s) is/are doing in order to act accordingly. The "tech tree" structure reflects this predictability: in *Warcraft III: The Frozen Throne* (Blizzard Entertainment, 2003), a Night Elf player has to build a Hunter's Hall and a Tree of Ages to build an Ancient of Lore and to recruit Dryads. The Hunter's Hall is a building that allows weapon upgrades to be researched: seeing enemy Dryads is thus a sign that weapon upgrades may have been started for the opponent. If Dryads are spotted early in the game, the opponent probably didn't have the time and resources to build an Ancient of Wind and recruit air units. If a move cannot be predicted by the opponent to a certain extent—whether it is because of its random cause or by the unpredictable series of actions to get to it—the players will feel that a proper strategy could not have been devised and that the game is unfair. To match a human mind, strategy games in PvP modes will often make their AI-controlled opponents "cheat," that is, have bonuses that keep them fairly competitive. But even these advantages stay within the limits of the predictable: they will respect the overall structure of resource acquisition in order for their opponents to gauge to a certain extent their possible actions.

Strategy and Fiction

The link between game rules and fiction in strategy games is often weak. In *Civilization* (1991–present), probably one of the most analyzed strategy series, the player controls a society from the foundation of its first city to the space era. This series has been criticized for its problematic portrayal of real history, for example, the "tech tree" structure described earlier is criticized for being a teleological and ethnocentric portrayal of the history of knowledge. Internal dissension is not possible with a despotic ruler, nor are there different parties in a democracy. Everything is managed by the player, as if a civilization was a monolithic entity in its history. But from a strategic point of view, the predefined structure of technological discoveries offers predictability and lets the player infer actions.

The fictional worlds of TBS games could be qualified as metonymic. In *Heroes of Might and Magic* (New World Computing, 1995), no matter if an army is composed of a hundred or a thousand gargoyles, it is represented in combat by only one that still occupies only one hex on the battlefield. In general, strategy games show fictional worlds that are ellipsized. In *Command & Conquer* (Westwood Studios, 1995), the Tiberium resource accumulated by the player is transformed into money that will be used to buy units and buildings. Units simply come out of buildings, which is an RTS convention. In order to create a plausible fictional setting, the player has to imagine that the hiring, arming, and training of troops are actions not represented but still present within the fictional world where these characters belong. Yet, in *Warcraft III: Reign of Chaos* (Blizzard Entertainment, 2002), when Prince Arthas and his small escort set foot on Northrend, a new continent, it is difficult to assume that new units can easily be recruited from there at the same cost in gold and wood.

Even in strategy games where the fictional world is borrowed from a multimedia franchise, such as *The Lord of the Rings: The Battle for Middle-Earth* (Electronic Arts Los Angeles, 2004), ludic conventions foreshadow naturalistic representation. In the book, Sauron launched his minions to Minas Tirith from Mordor, but in this RTS enactment of the narrative, the Mordor player needs to erect new buildings on the Pelennor Fields in front of Minas Tirith, and amasses gold and spawns new units directly from there. Rohan reinforcements on the battlefield, instead of arriving after a long journey, can be summoned by a spell. While it appears as though battlefield themes are more suited for strategy games, their narrative frame needs to be adapted to strategy games' conventions.

Toward a History of Strategies

Most of the RTS conventions are directly borrowed from *Dune II: The Building of a Dynasty*, which itself owes a lot to earlier games that combined real-time and strategy, such as *Stonkers* (Imagine, 1984), and does not include a multiplayer mode, a central element for most RTS players since *Warcraft: Orcs and Humans* (Blizzard Entertainment, 1994). Some later games from the genre were qualified as "e-sports," a competitive scene of professional gamers followed by an impressive number of spectators. The history of strategy games does not follow a linear path, the *history of their strategies* being of a certain importance even on a larger scale. This history deals more with interactivity itself and will need to be more precise in the future in order to understand the role of wargaming in strategy video games, as well as the emergence of competition and e-sports in RTS games.

Such a history is related to what Hans Robert Jauss called an "aesthetic of reception" in the field of literary studies. His idea was that while charting the history of literature, one needs to understand the history of its audience. Thus, for him, a "literary work is not an object that stands by itself and that offers the same view to each reader in each period. It is not a monument that monologically reveals its timeless essence" (Jauss, 1982, p. 21). Reception in a video game context could mean the critical reception of a video game, as well as how gamers use it. However, in adapting this thought to games of emergence, it is worth noting that there are at least two receptions implied. The analysis of a video game's reception is usually done through an examination of reviews released synchronically with the game. But each new playing of a video game can be analyzed through the reception lens, although it is more difficult to grasp: tournaments reports, collection of replays, and recorded video game sequences are all archives of such a reception. The history of chess exists (Murray, 2002) and demonstrates how player strategies have changed throughout history. It would therefore be meaningful to see the reception of specific matches, to document each player's moves. Being interested in the reception of a certain video game can mean at the same time looking at the reception of matches that appeared around its release date, years later, or even earlier, in beta or alpha versions.

Consider this *StarCraft: Brood War* (Blizzard Entertainment, 1998) example. During the 2002–2003 KPGA Winners Championship finals, BoxeR—players indeed give themselves different pseudonyms—was losing a series 0–2 against YellOw. At the beginning of the third game as it is shown in the video available online (MickeyToss, 2006), he surprised both the audience and his opponent with a "SCV Rush," a fast attack with few military units and almost all of his workers. "Workers" refers to different resource gathering units in RTS games, including ones that can attack in some RTS games, at least since *Warcraft II: Tides of Darkness* (Blizzard Entertainment, 1995). YellOw failed to defend against this attack and BoxeR showed how this strategy could be viable. Supporting a decisive attack with workers is still frequent in *StarCraft II: Wings of Liberty* (Blizzard Entertainment, 2010).

Strategy in a given game cannot be mapped on its release date. If we were to trust Bart Farkas's (1998, p. 37) strategy guide released the same year as *StarCraft*, we would assume that Infested Terran is a strong unit. As strong units usually have a lot of prerequisites, Infested Terran seems like the ultimate weapon for players to obtain. However, the wiki strategy guide Liquipedia states that Infested Terran is almost never used (*Infested Terrans*, 2011). The Queen is another *StarCraft* example. It is a unit that was not really used in tournaments at the end of the 2000s (*Queen*, 2009). Still, in a *StarCraft* league match that occurred December 10, 2009, Zero managed to use a Queen's ability to counter a common strategy (nevake, 2011). His opponent seemed surprised by this maneuver, and tried to use an outside-the-box strategy himself. Without the knowledge of a match's context, one cannot know the rarity of a strategy someone uses and explain why some actions are more surprising than others. Wikis such as Liquipedia or StrategyWiki are useful tools to understand strategies in time, although we must make sure they are up-to-date and actually used by the players' community of a given game. Which patches a game's software was using depends on the date of a particular match, and determines what was possible in that game. A reliable archive or database of every version and patch of every video game does not exist, however. Even if for a certain game there is a clear and precise indication of what a patch changes on the developer's website or on a fan's website, it is sometimes unclear as to how they change strategies. It is necessary to have knowledge of the situation of a game in order to know what problem a patch was trying to fix: was there a balance issue with one specific unit? Was there an exploit to limit? In *Sid Meier's Civilization V* (Firaxis Games, 2010), a hotseat mode was absent from the original version, but after being "much-requested," was later introduced in a patch (2K Greg, 2010). The very existence of patches confirms that the way players play is not static, but changes over time, and that game developers try to respond to their community.

These examples show how the context of play is not necessarily the context of the release date of the game. If I say "Infested Terran is useless in *StarCraft*," I have to be somewhat more precise, for the word "*StarCraft*" in this sentence could mean *StarCraft* in 1998 or *StarCraft* in 2009, as well as refer to different skill levels usage. An analysis of game rules is not an analysis of game plays. As shown earlier, the workers attack mode in *Warcraft II* does not indicate that common strategies featuring workers exist. As Lowood puts it, "we must not lose sight of how we will document interactivity itself, which means capturing traces of *activity*, that is, gameplay" (2004, p. 6). He gives the example of basketball: we could preserve the game rules book, the game's artifacts, or recordings of gameplay. The activity of actually playing the game goes beyond these objects. We could isolate at least two ideals in the preservation of specific gameplay segments.

Exhaustiveness as an Ideal and the "Replay" Feature

First, there is the recorded game or "replay" file, which in most cases fulfills an *exhaustiveness* ideal. It is with a patch that some games such as *StarCraft* introduced a replay feature. In a lot of competitive games, from RTS games to first-person shooters, players can save their game when it is over in order to watch it later: every single move of a player is encoded in the file and can be reenacted. Depending of the game, observers can take the point-of-view of each player or have their own perspective on the action.

Age of Empires II: The Age of Kings (Ensemble Studios/Microsoft Game Studios, 1999) didn't feature any recording possibility before the "Gold Edition" (which comprised the original game and its expansion) was released in August 2001. Thirteen years earlier, *Modem Wars* (Ozark Softscape, 1988), which ambitiously tried to move strategy games toward a human vs. human dynamic similar to sports that was uncommon in 1988, did let players record their game (Hockman, 1989, p. 35). The game was not a commercial success for, among other reasons, modems were not common enough at the time of its release date (Donovan, 2010, p. 300). It took more than a decade of gameplaying and technological improvement before replays were really seen as useful for players. Although *Warcraft II* was republished to be included in Blizzard's online servers (*Warcraft II: Battle.net Edition*, Blizzard Entertainment, 1999), it never officially featured recorded games except with third-party applications released years later. The history of replays shows how the reenactment of a match, in order to learn from it, was not a specific need in the early days of strategy games, even if it is an essential feature in today's RTS game-playing.

For different reasons, exhaustiveness is not the most efficient ideal for charting the history of strategy game-playing. A lot of RTS games and most TBS games simply do not have a replay function. Even when they have, how can we know if a replay collection is really representative of certain strategic habits of the time? In a single replay file, a move is not seen in context. Every action is there and can be cataloged, but it is difficult to understand, from an external point of view, the *meaning* of using a Queen in 2009 within the history of *StarCraft*, for example.

Meaningfulness as an Ideal and the Audio Commentary

Preserving a game in a video file with an audio commentary fulfills a *meaningful* ideal. Game tournaments have their own commentators and the matches are shared in video formats online. The commentators usually have recorded their description at the time when the game was played and, in addition to their great knowledge of the game rules and the game context, they will interpret each decision and explain it in more or less detail to future viewers, archivists, and researchers. The *StarCraft* e-sport scene is mostly set in South Korea, but there are competent commentators speaking different languages. Using renowned commentators as a source is still relying on human beings and does not prevent potential errors. Because the comment is made in real-time, a commentator can easily miss important events in a game, so researchers have to know the basic mechanics of the video game they are trying to understand and be aware of commentators' quick interpretations.

Since the *StarCraft* series has a popular competitive scene, with renowned commentators and analysts and an active online community, reliable sources are available for analyzing strategy. But a history of strategies is more difficult to trace for games without a massive audience and competitive scene. It is thus necessary to carefully analyze the sources that are still available today. Game reviews, editorial articles in gaming magazines, and strategy guides can help us to seize typical expectations toward strategy in a given game and at a given time. In the early *StarCraft* area, when online videos were rare, battle reports were written online by Blizzard in order to raise an interest in their tournaments. Such sources must be investigated in earlier strategy games. Certainly, each review or each description of a game is not *exhaustive* about what the video game or genre is at the time it was written. However, it is *meaningful* to note that a certain author, developer, or company raises some questions or explains some actions and not others.

Conclusion

Each new playing of a strategy game is historical, and its archiving can give us a certain context within the history of strategies. It is therefore crucial to use and preserve different kinds of archives especially in the case of strategy games, whether it is the game itself, videos, replays, strategy guides, reviews, etc. Exhaustiveness and meaningfulness are both complementary goals for a game researcher to understand the history of strategies for a given game, series, or genre. Using each type of source necessitates a familiarity with game mechanics and a diversity of meaningful sources.

Strategy is a genre that game studies has not probed deeply yet, probably because each video game studied necessitates a large amount of time for its mastery. Methodological investigations in strategy analysis should address this in the future by showing how a complex activity such as strategy can be meaningfully archived. I hope this essay raises relevant perspectives on this question.

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Part V

CULTURAL ASPECTS

35

CONVERGENCE

Robert Alan Brookey

The term “convergence” is a buzzword, a term that is often overused and sometimes misused. Convergence, boiled down to its common meaning, refers to acts of meeting, or coming together. More recently the term has been used to refer to the alignment and overlap of digital information and services. For example, cable providers and telecoms offer consumers the option to combine telephone, cable, and Internet services into the same package, and often encourage this bundling in their promotions. Media convergence also often refers to the repurposing and redistribution of content across different delivery platforms, and here the waters get a bit muddy, because these particular practices predate the digital technologies that facilitate convergence today.

For several decades, the different entertainment industries, particularly television and film, operated as discrete industries. There was some overlap, to be sure, but rules and regulations about media ownership kept this overlap to a minimum. As Joseph Turow (1997) explains, the 1980s brought about some significant changes for the media industries. Some of these changes were technological, such as the advent of cable and the growing popularity of the VCR, as both of these developments served to turn the television into a device through which films could enjoy a lucrative secondary market. The other changes were regulatory, and with a relaxation of media ownership rules, media outlets were being bought up in record numbers and large media conglomerates were emerging. For example, in 1989 Sony purchased Columbia Pictures, and Time Inc. merged with Warner Communications. Four years prior, Rupert Murdoch bought out Twentieth Century Fox, and a year later would leverage the studio name to create a new television network. These acquisitions would continue into the 1990s, and in 1996 Disney bought up ABC, Inc.

In order to maximize the potential of all these various companies, these media conglomerates looked for new ways to repackage and redistribute popular content across different media outlets, and to use the different divisions to cross-promote the various media products of the conglomerate. Therefore, a popular film produced by the film division could generate a popular soundtrack published by the conglomerate’s music division, and the promotion of the film would augment the sale of the CD, and so on. Synergy was the term coined for these new business practices.

Then, around the turn of the millennium, the entertainment industry went digital. VHS tape gave way to DVDs, and old analog cable systems were replaced with fiber optic digital systems. It is at this point that media conglomerates began adopting the term “convergence” and a new buzzword came on the scene. But because convergence means different things to different industries, confusion often ensues. In the digital technology and IT industries, convergence is about data, whereas in the media industry, data are content. This might seem like a fine distinction, but it actually is very important, because for most media conglomerates “content is king,” and data are a means of storing, editing, packaging, and distributing that content.

Convergence and Video Games

When it comes to video games, we are dealing with an industry with one foot in technology and one foot in media. Historically speaking, the video game industry has had a close relationship with the computer industry, and in the early years of the video game industry the products were often called “computer games.” There was some early overlap with media when Warner Entertainment acquired Atari, but that overlap produced the notorious *E.T. The Extra-Terrestrial* game (1982). For most of the 1980s, and a good deal of the 1990s, video games were the domain of computer technology, and even some of the consoles produced at this time were marketed as home computers (Kent, 2001). When Sony introduced the first PlayStation in the 1990s, a few short years after it had acquired Columbia Pictures, it would begin an alignment between traditional media and video games that has continued to the present. This was in part because the console utilized CD-ROM technology that allowed for the development of video games that were graphically and narratively complex. Although there were game consoles utilizing CD-ROM drives that were released before the PlayStation, those consoles did not enjoy Sony’s success. When the PlayStation 2 (PS2) was released it was marketed as a convergence device that could play DVDs and video games, and the first Xbox would make the same claim. The introduction of DVD technology further heightened the complexity of game graphics and narratives, beyond the levels achieved with CDs. In addition to DVD technology facilitating the multimedia functionality of game consoles, video games themselves began to more closely mirror the production of traditional narrative media. Alexis Blanchet’s (2011, p. 14) work illustrates this important trend:

> Analysing the number of simultaneous adaptations published per year brings out three distinct phases of activity: from 1975 to 1983, between one and four films per year gave rise to a simultaneous adaptation; from 1984 to 2001, the publication of simultaneous adaptations concerned on average a dozen films per year; and finally, since 2002, the average has exceeded 22 films per year. This continuous increase in the use of simultaneous adaptations bears out the interest of film producers in this type of commercial and creative synergy with video games and their commitment to it.

The fact that a spike in adaptations occurred shortly after the release of the PS2 and the Xbox is no accident, and can be attributed to the emergence of DVD technology (Brookey, 2010).

This convergence has continued with the current generation of consoles. The PlayStation 3 (PS3) and the Xbox 360 were designed to deliver HD content, just as television manufactures began ramping up HD production, and major film and television studio began rolling out HD content. In addition, the PS3 was used to market the Bluray technology that would be the primary HD format for distributing both films and television shows for the home video market (Brookey, 2010). Consequently, while the video game industry is still very much a part of the development and deployment of digital technologies, the actual content of video games is being influenced by traditional media industries, both directly (through spinoffs) and indirectly through evolving game aesthetics.

Because convergence has been used to describe a multitude of practices, the term has become ambiguous. And because convergence, as it has been applied to the video games, reflects the interests of both technology and media companies, the ambiguity of the term has been compounded. Consequently, my purpose will not be to define the phenomenon of convergence, but to review how other scholars have discussed the phenomenon. Although not exhaustive, this review will include important contributions to the discussion of convergence as it relates to video games, and I will offer observations about specific convergence practices involving the film and mobile telephony industries.

Different Perspectives on Convergence

Despite the fact that he was not focusing on video games exclusively, Henry Jenkins's work on convergence is significant to the degree that it has become a touchstone for the discussion of convergence in video game studies literature. In his book *Convergence Culture*, Jenkins (2006, p. 282) defines convergence (in a glossary, no less) thus:

> A word that describes technological, industrial, cultural, and social changes in the ways media circulates within our culture … Perhaps more broadly, media convergence refers to a situation in which multiple media systems coexist and where media content flows fluidly across them. Convergence is understood here as an ongoing process or series of intersections between different media systems, not a fixed relationship.

While Jenkins clearly acknowledges the centrality of the media industry to the practices of convergence, he suggests that media consumers enjoy an equal, if not more powerful, role in these practices. He maintains that in important ways, "convergence occurs in the brains of individual consumers and through their social interactions with others" (Jenkins, 2006, p. 3). While technology might facilitate convergence, and media corporations may design convergence strategies, it is consumers who cognitively make the intertextual connections across the associated media texts. For Jenkins, convergence opens up new, participatory forms of entertainment, and new opportunities for pleasure.

Jenkins does not completely dismiss the role of technology in convergence, and he notes how both Sony and Microsoft had ambitions for their respective game consoles (the PS3 and the Xbox 360) to function as devices through which all digital media would flow. He argues, however, that this "black box" approach to convergence, the idea that all media will be consumed through one device, is a fallacy, and that convergence has actually brought about a proliferation of devices. Jenkins's purpose is to warn against the tendency to collapse convergence into technology (Jenkins, 2006, pp. 14–16). While technology, and digital technologies in particular, have accelerated media convergence, these practices still involve relationships between corporations and consumers, and fans and content.

Unsurprisingly, given Jenkins's body of work, he believes that convergence will ultimately empower consumers, and the examples he provides in the book are offered to illustrate this belief. While he acknowledges the corporate motive behind convergence, he suggests that in actual practice the power of media conglomerates is often undermined by internal dysfunction, and so corporations are not always as powerful as they may seem, nor are consumers as powerless.

In contrast to Jenkins, the work of Stephen Kline, Nick Dyer-Witheford, and Greig de Peuter (2003) provides an approach to convergence that is decidedly less celebratory. I should note that they actually posit a model of interactivity in which convergence is a subordinate term, but their model has influenced other work on convergence, so it is worth mentioning here. Kline et al. suggest that in spite of all the new opportunities that new media has opened for consumers, this new media still has the same profit motive as the old media. They also note that immersion is often the end game for most of the technology that falls under the umbrella of "new media," an experience in which the actual technological interface becomes transparent in the act of consumption. An example would be fully-engaged game play, when the player instinctively inputs responses in the control pod without actually thinking about those responses or the specific buttons involved. In these instances, Kline et al. argue the consumer ceases to reflect on the technology involved in the experience, or the conditions of its production and operation.

Drawing on the work of Raymond Williams, Kline et al. propose a model of interactivity that has three circuits: technology, marketing, and culture. The technological circuit, as they describe it, takes into account the work of game and computer programmers, the actual hardware, and the experience of the player as a "user of computers and consoles that are increasingly linked to a networked telecommunications environment" (2003, p. 55). The marketing circuit involves the practices of promotion that frame a cultural product and give it meaning. In terms of the video game industry, these practices can involve "phonelines, magazines, films, merchandising tie-ins, virtual tournaments, sponsorships, Web sites, game rentals and trials, and a host of other marketing synergies and public relations strategies" (2003, p. 57). Finally, the cultural circuit conceives of games a means through which meaning circulates between designers and gamers; and to the degree that games reference other forms of popular culture, games operate as means of reproducing and/or subverting cultural norms.

Barry Ip (2008) uses Kline et al.'s "three-circuit model" as a touchstone in order to develop his own model of convergence, one designed specifically to address convergence in the context of the video game industry. Ip acknowledges the complexities of the concept of convergence and references several different forms of convergence in the beginning of his essay. He suggests that the three-circuit model can be combined with the concept of convergence space, and out of this combination he develops a framework in which to analyze the areas of technology, content, and markets as they relate to video games. Where technology is concerned, new video game consoles are developed to incorporate technologies that serve several different functions; the incorporation of Blu-ray drives in the PS3 illustrates these practices. Content involves the practices of repurposing narratives and characters across forms of media (films spun-off as video games, for example). Market convergence refers to the bundling of services (Internet, television, and telephone) by telecoms and cable companies.

In his conclusion, Ip raises certain concerns with the practices of convergence in these three areas. In terms of convergence, he questions the quality of the games produced when content is repurposed. Ip also notes that the efforts to develop consoles as pieces of convergence technology has paradoxically resulted in closed gaming systems, and argues instead that convergence should be used to develop industry standards that open up gaming opportunities to consumers. Finally, he avers that while the openness of standardization may be realized in the market convergence of telecoms and cable companies, he acknowledges the various complexities of corporate, national, and international policies that may serve as roadblocks. In spite of Ip's pessimism on this point, he shares Jenkins's belief that convergence has shifted the balance of power where media producers and consumers are concerned. As he states, "the most exciting prospect of media convergence will be the increasing shift of power to consumers, in which usergenerated content, differing cultures, and social communities take priority over that which is prescribed by traditional content developers" (2008, p. 220).

Casey O'Donnell (2011) is not as nearly optimistic when it comes the practices of convergence, particularly as they apply to labor. In his article, which appeared in the journal *Convergence*, he argues that most studies of convergence, at least where video games are concerned, overlook the specific aspects of production. As he notes, conceptually convergence is often used to refer to an unfettered media flow that circulates content from one delivery platform to another. O'Donnell suggests instead that convergence in practice is better conceived as kludges and disconnections, particularly at the level of production. The level of production, as O'Donnell defines it, is very specific to the actual practice of game design and development. Subsequently, and in order to prove his point, he conducts an ethnographic study of a game studio tasked with developing the video game spin-off of the *Spider-Man* 3 film (Sam Raimi, 2007).

In his analysis, O'Donnell, observed several problems with the practices of convergence as they relate to the *Spider-Man 3* video game (Treyarch, 2007). For example, the information flow between the film and video game productions was limited and untimely:

> While filming was largely complete nine months prior to the release of the videogame, little data flowed between the companies. Much of the movie script remained out of the hands of the game producers until late in the production of the game. Basic story lines were known, but little information flowed from the team producing the movie to those producing the game.
>
> (2011, p. 274)

O'Donnell also notes that there were significant challenges to reproducing certain aspects of the film, including the "web-slinging" used by the Spider-Man avatar. In addition, different studios (although both were owned by Activision) were tasked with producing versions of the game for the different gaming consoles. On the specific level of game data, the majority of the files had to be modified or newly created in order to port the game from one platform to another.

O'Donnell concludes that convergence needs to be primarily considered a labor practice:

> Data does not flow through the system. Humans or computers process it, or it is parsed and presented on the screen mediated by software applications. Cross-media production converges less than it diverges. Data multiples and is re-created in different applications bringing new capabilities. Human labor and computer processing power are leveraged through these systems to bring the semblance of convergence.
>
> (2011, p. 280)

Although O'Donnell never says as much, his article gives the impression that individuals who labored to produce the *Spider-Man 3* video game, were not on the same level as those who produced the film. In my own research I know this to be true; when it comes to video game spin-offs, the game is considered an ancillary product, subordinate to the original film in several respects.

There are those in the video game industry who have been highly critical of convergence, in part because they believe the video game industry is losing its independent creative spirit. Even allowing for the fact that the creative independence of the video game industry is perhaps more of a myth than a reality, there is some cause here for concern. As I have argued, when games repurpose film content, the primary motive is not to create a great gaming experience; it is to promote the film (Brookey, 2010). Consequently, some of the games that are produced in this manner are not very good games. The *Spider-Man 3* game is a case in point; the PS3 version received a "6" rating on IGN.com, and is described as "okay." I have played this game, and I would agree with this assessment.

The *Spider-Man 3* game, however, illustrates the extent to which convergence and synergistic practices can become entwined in a large media conglomerate such as Sony. Although the European and Japanese markets had different release dates for both the *Spider-Man 3* game and the PS3 console, in the US the game was released six months after the console appeared in stores, in conjunction with the release of the film in US theaters. To the degree that the video game was a highly visible release for Sony's game console, the video game became a product that linked Sony's film and video game divisions. In addition, keeping in mind that the PS3 also served as an important product in which to market the Sony's Blu-ray technology, the *Spider-Man* film franchise was used to promote another important Sony product. Consumers needed to look no further than the packaging of these products to see evidence of this strategy. The *Spider-Man 3* film, the *Spider-Man 3* video game, and the PS3 used the same Homoarakhan font in all of their brand logos.

Clearly then, the *Spider-Man 3* game was just one tactic in a much broader strategy to deploy the established popularity of the *Spider-Man* film franchise across a variety of Sony products. The actual quality of the game was not of primary importance to this strategy, and consequently, as can at least be inferred from O'Donnell's ethnography, it was not of primary concern to Sony either. While the convergence of the film and video game industries may have produced some questionable games, not all of the games produced through these practices are inferior. Furthermore, as Blanchet's study indicates, the convergence of film and video game content, while not abating, has at least plateaued. Therefore, the impact of this convergence may have already been realized, and video game industry has yet to be subsumed by the film industry. There is another form of convergence that is emerging, however, and its full impact has yet to be realized.

The Mobile Future

With the advent of the 3G phone, and continuing with the ongoing deployment of 4G technology, mobile phone manufacturers and service providers have entered into the handheld games business through their various application stores. In order to promote its iPhone and iPod Touch, Apple introduced its "App" Store in July 2008. In less than three years, 10 billion applications have been downloaded from the store, and games are often among the top downloads. As Brian Caulfield (2011) notes, although Apple entered the gaming market almost accidentally, it has become a force to be reckoned with, and may overtake the traditional video game companies in the future. Caulfield also observes that Google's Android platform is attempting to follow Apple into the gaming market. As of March 2011, Android had a significant lead over Apple in terms of the installed base of cell phone users, with 37 percent share as opposed to Apple's 27 percent share. In addition, there are indications that the Android Market Store may overtake Apple's App Store in terms of the number of applications offered (Murphy, 2011). As Google gives games a very prominent place on the Android platform, it too is posed to make inroads into the video game market.

Of course, Microsoft's Windows Phone 7 and Blackberry's RIM platforms also offer game applications, but neither has established any presence in the mobile gaming market. Apple and Google, however, are making their presence felt. A recent report from Flurry revealed the mobile game market share for iOS and Android combined grew from 19 percent in 2009 to 34 percent in 2010, while Nintendo's market share declined from 70 percent to 57 percent and Sony's declined from 11 percent to 9 percent (Farago, 2011). Combined, these two platforms generated $800 million in sales in 2010, up from $500 million in 2009.

At this point, it may be worth mentioning the basic business models of Apple and Google in the context of the mobile phone market. Apple manufactures a product with a proprietary software platform, and Google produces a software platform that it licenses to a variety of mobile phone manufactures. Therefore, Apple generates revenue from the sale of its phones, whereas Google generates its revenue from the licensing fees that it collects by offering applications through Android Market. In addition, both companies are able to generate revenue from a cut of the third-party app sales and access to their respective app stores. These practices are not a complete disconnection from the way Sony and Nintendo generate revenue from licensing fees, and it should be understood that game applications alone do not drive the success of either the iOS or Android platform. In terms of Nintendo's DS and Sony's PSP, the success of these devices is contingent on the games that they offer. While it may seem like Apple and Google's entry into mobile gaming opens the market, neither company has a strong, vested interest in either innovation in video gaming or the actual quality of the games.

Although the mobile telecom industry is becoming an important force in the handheld gaming market, games available for mobile phones are often locked into operating systems and specific types of phones. While Jenkins's claim about the black box fallacy may be true when it comes to the home, 4G mobile phones are marketed as devices through which all media can be consumed. Furthermore, service providers, such as Verizon are now offering plans through which a number of devices can enjoy mobile connectivity through the same service. Apple's legal action against Samsung in 2012 illustrates how protective it has become about its products and its iOS environment. The real fear of the black box has to do with the amount of control corporations can exercise in this marketplace. The current convergence of mobile telephone and video games reveals that a limited number of companies are battling for market dominance, and there is cause for concern about how that dominance might manifest itself in the handheld game market.

Ultimately, however, convergence is not the problem; rather it is how convergence is specifically practiced and how those practices impact consumers. Therefore, it may be more productive for video game scholars to consider convergence practices in context. Instead of comparing those practices to some predetermined taxonomy that attempts to define convergence, scholars should investigate the outcomes of specific convergence practices to determine if they open up opportunities for gamers, or if they merely close them down. There may be disagreement about the positive and negative impacts of convergence, however, we can agree that we want the practices to produce the kinds of gaming experiences that inspire both gamers and scholars.

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36
CULTURE
Frans Mäyrä

High and Low: Culture as Distinction

“Culture” is a complex concept with multiple different uses and meanings. The main senses that dictionaries deal with relate to “arts and culture” on the one hand, and “customs, norms and ideas” on the other. Both of these uses have their origins in the etymological root of the Latin *cultura*, meaning “growing,” “cultivation.” Culture is not something we are born with, but rather something that we learn and adopt from our environment as we grow up. When “video game culture” is considered, all these basic dimensions of the concept are relevant. The discussions and research surrounding the game culture and cultures of gaming involve both appreciation of games as cultural phenomena, or art, as well as the surrounding cultural norms and players’ practices. While the first approach is primarily related to aesthetics and the humanities, and the latter mostly to the social sciences, they are today combined and mixed together in other various approaches to “culture.”

One key dimension that separates the different approaches to culture is the degree to which they are normative, or perceive culture as a question of certain standards. The classic Latin conception of culture as cultivation is related to an extensive tradition of educational discussion, where adoption of culture is something that needs to be taught and upheld. For a long time, this meant studying and learning the Bible, or the classic works of antiquity, and one could claim that many discussions of “high culture” have a certain built-in conservative tendency. For example, the nineteenth-century poet and literary critic Matthew Arnold recommended culture “as a pursuit of our total perfection” and defined it as “the best which has been thought and said in the world” (Arnold, 1896, p. viii). Adopting this approach to video game culture, we should not automatically consider just any game as “culture,” but rather only those works that rise above the rest and set lasting standards. It is even possible to set the cultural standards so high and tight that video games are completely excluded from within them.

As contemporary and popular cultural forms, video games have been involved in heated debates similar to those that have focused also on cinema, comic books, and rock music, linked to a long tradition of “moral panics” (Cohen, 1972; Starker, 1989). Even novels as entertaining works of fiction were initially suspect in the eyes of educators and moral authorities (Vogrinčič, 2008). Commercially-produced popular culture has long been accused of having of negative influences, and thereby not fulfilling the sophisticated criteria required from “true culture.” Such debates have also gained political undertones, and so-called “mass culture” has been condemned by both the political Right as well as the Left.

The Frankfurt School is a good example of this approach to culture. The School consisted of neo-Marxist German thinkers such as Theodor Adorno, Herbert Marcuse, and Walter Benjamin, who were critical both of the Soviet-style socialism as well as of the "technological rationalism" governing capitalism and Western civilization in general (see Marcuse, 1991). Their critique of popular culture as "mass culture" focused on the inherent power relationships in its production and consumption. The consumer of mass-produced culture, such as video games, supposedly becomes automatically subjected to their built-in logic of capitalism. Later, the cultural studies movement has continued the critique, while also taking into account the potential of consumers to resist passive indoctrination and adopt more active attitudes. The debate about the cultural value of video games has consequently gained new tones: games can be "good" or "bad" both in terms of their artistic value, as well as due to the positive or negative political or ideological influence that they supposedly have upon their players.

In their book *Digital Play: The Interaction of Technology, Culture, and Marketing* (2003), Stephen Kline, Nick Dyer-Witheford, and Greig de Peuter present a critique and analysis of video game culture from a perspective informed by political economy and cultural studies. They discuss the optimistic claims of the early commentators of digital technology and video game culture such as Nicholas Negroponte and Douglas Rushkoff, and reject their most extreme assertions about the revolutionary, liberating, and activating potentials of new media. While there is an important cultural shift taking place from spectators to players in media culture, Kline and his co-authors want to point toward the hidden power-relations and structural limitations built into contemporary video game culture. Players of a first-person-shooter, for example, are not completely free to choose their own path and actions, but are rather framed in a very particular kind of position, having only certain pre-programmed objects and activities available to them. The authors assert that the culture of video games is produced and consumed within a large complex of feedback loops where technology, marketing, and culture mix and interact with each other (2003, pp. 50–59). The involved dynamics and processes remain largely hidden from an individual game player, and the authors claim that it is actually in the best interests of video game industry to "make sure that the player does not reflect on these forces" (2003, p. 19). However, the game industry is an important part of "global culture industry," which is a system that is increasingly focused on production of symbols and "cultural difference" rather than traditional commodities. Scott Lash and Celia Lury (2007, p. 5) have noted that in this era of virtualization and globalization, cultural entities have also a tendency to "spin out of the control of their makers."

One of the most well-known social theories of culture has been presented by the French sociologist Pierre Bourdieu. In his work *Distinction: A Social Critique of the Judgment of Taste* (1984), Bourdieu shows how the ability to differentiate between "good" and "bad" in everyday life as well as in arts and aesthetics is related to the surrounding social and cultural frame or "field." His key concept, "cultural capital," highlights the important role such knowledge and cultural know-how has in people's lives. Bourdieu uses the example of knowing the names of film directors (1984, p. 27) as a form of cultural capital. Mia Consalvo has extended and applied Bourdieu's theory to game studies and introduced the concept of "gaming capital." She argues that being a member of game culture goes beyond knowing how to play games: "It's being knowledgeable about game releases and secrets, and passing that information to others. It's having opinions about which game magazines are better and the best sites for walkthroughs on the Internet" (2007, p. 18). It is at this intersection of games and player activities where the aesthetic tradition of studying "the best which has been thought and said" starts to intermingle with the more value neutral approach of studying cultural practices, which has a notable intellectual tradition of its own.

The Cultural Anthropology of Gaming

The scientific study of human societies and how daily life and social relations are organized in different parts of the world originated in the nineteenth century, as the study of classic Greek and Roman civilizations and their culture turned into study of all kinds of civilizations. The birth of social and cultural anthropology was also related to the history of colonialism and its associated cultural contacts and conflicts. It gradually became obvious that there was not only one way of organizing life, and that Western culture was only one among many.

The early pioneers of cultural anthropology were attempting to describe cultures as well as to explain cultural change. A famous early anthropological definition of culture was published by Edward Burnett Tylor in his work *Primitive Culture*: "Culture or Civilization, taken in its wide ethnographic sense, is that complex whole which includes knowledge, belief, art, morals, law, custom, and any other capabilities and habits acquired by man as a member of society" (1871, p. 1). Tylor was a believer in cultural evolution: the primitive people were for him like children, capable of learning and developing more advanced culture. In contrast to some of his contemporaries, Tylor considered that the people of other "primitive" or "savage" cultures were nevertheless as intelligent as Western people (p. 62). Tylor suggested that as gameplay often imitated "serious life," it was possible to learn from the history of culture by studying its games (pp. 65–75). The anthropological interest in games later produced some major works, such as Stewart Culin's *Games of the North American Indians* ([1907] 1992a, [1907] 1992b), which catalogs various gaming practices and associated toys and playthings, while organizing the diversity of Native American games into two broad categories, games of chance and games of skill.

Most contemporary approaches to cultural anthropology have moved toward more dynamic perceptions of culture: rather than ready-made systems of thought that somehow exist in people's heads, culture should be seen as intersubjective domain of experience that takes shape in social relations (Boellstorff, 2006, p. 31). For game studies, cultural anthropology has been most influential through its promotion of participant observation as a research method. While it has occasionally been possible to publish academic research about video games and game players without the researcher having any first-hand experience of having played games himself/herself, contemporary ethnographic approaches to games and play have changed that by now.

One of the first published ethnographies of video game play is David Sudnow's book *Pilgrim in the Microworld* (1983). Entirely focused on a single, early video game—*Breakout* by Atari (1976)—Sudnow describes his personal obsession to master the game. A piano teacher who also had a Ph.D. in sociology, his account is a detailed, insider description of how a person who learns a new skill feels and thinks. However, Sudnow's quest is a solitary one; even while his book opens with an account of how he first met the world of video games when he entered a video game arcade to pick up his teenage son, the social sphere and practices of young people who were the “typical” video game players at the time are mostly left out of the book. Sudnow approaches *Breakout* and the Atari 2600 home console as a musical instrument, and the culture of game play is described as an individual journey toward virtuosity.

The research of digital play as a social and cultural phenomenon has been lagging behind the rapidly evolving field of games and player behaviors. It was the evolution of online, multiplayer games that particularly stimulated the research when it became clear that new forms and conventions of social interaction were in the process of being created. Scholars with a background in the humanities and in the field of computer-mediated communication research were among the first to explore the customs and habits of online communities from an anthropological perspective. For example, the early, influential undergraduate thesis of Elizabeth M. Reid titled “Electropolis” (1991) described some of the innovative practices of textual, synchronous communication that users of the Internet Relay Chat (IRC) system had developed. Based on her participant observation, Reid claimed that among its users, IRC was perceived as a playground for free experimentation with different forms of communication and self-representation. She said that “users of IRC do not shape themselves according to or in conformity with the conventions of social contexts external to the medium, but learn to ‘play’ their ‘cultural game’ with them” (Reid, 1991). Somewhat similarly, Amy Bruckman’s early studies into text-based, online multiplayer games, such as MUDs (multi-user domains) and MOOs (MUDs, object-oriented), provided descriptions and interpretations about the online game worlds and their player cultures, relying both on her own experience as well as of earlier social and cultural theories. Inspired by the work of Sherry Turkle (1984), Bruckman (1992) used a combination of participant observation and interviews to detect conversational practices, social hierarchies, and forms of participatory culture evolving in these shared online environments.

As the popularity of massively multiplayer online role-playing games (MMORPGs) has grown, ethnographic studies based on participant observation in such virtual worlds have also expanded into a significant area of game studies. The lives and cultures of players inhabiting such virtual game worlds as *EverQuest* (Verant Interactive, 1999) and *World of Warcraft* (Blizzard Entertainment, 2004) have been analysed in many articles and dedicated volumes. For instance, T. L. Taylor’s book *Play Between Worlds* (2006) explores the online game culture through her own experiences as an experienced *EverQuest* player. In her study, she pays special attention to the ways game and non-game spaces, online and offline lives mix and interact, as well as to the practices of “power gamers,” who appear to play in a manner that makes it very similar to “work.” Much of such discussions involve appreciation of multiple frames of signification that game players are capable of inhabiting simultaneously, and of the sometimes conflicting values and norms that govern their multi-layered lives.

American sociologist Erving Goffman has identified game-like characteristics in everyday social life, suggesting that the multi-layered realities that online gamers inhabit may not be fundamentally that different from the regular situation in social life. Goffman (1956, 1974) suggests that our perceptions of social reality are organized in various frames, and that people are concerned as to what kind of impressions their words and actions gain while interacting with others in different contexts. In the field of game studies, such an approach is particularly relevant when role-playing games (RPGs) are being analyzed. One of the most detailed participant-observer studies in this area is Gary Alan Fine’s work *Shared Fantasy* (1983), where he depicts the gaming culture of American *Dungeons & Dragons* (*D&D*, Gary Gygax and Dave Arneson,

1974) table-top role-players at the end of 1970s. In addition to making an important theoretical contribution by differentiating between interactions that take place in “real life” (off-game) as opposed to “player frame” (in-game) or “character frame” (in-character), Fine’s work is also informative in exposing, for example, the male chauvinism that was a major part of this particular, wargaming-based culture of fantasy role-playing.

As norms, player practices, and ways of speaking vary between games and player groups, the field of game cultures is very diverse when one takes a closer look. Not all *D&D* fantasy gamers are male chauvinists, and at the opposite end of fantasy gaming, the contemporary Nordic live action role-play (larp) culture, for example, is indeed very different from the early wargaming style of table-top role-play—and the cultures created in MMORPGs such as *EverQuest* and *World of Warcraft* are again different from both of those. One concept that is useful in making sense of such distinctions is “subculture.”

Subcultures and Gaming

In his seminal text *Homo Ludens* ([1938] 1955), Johan Huizinga paid attention to the ways in which play and games stimulate the growth of particular kinds of communities. Huizinga notes that play “promotes the formation of social groupings which tend to surround themselves with secrecy and to stress their difference from the common world by disguise or other means” (p. 13). In Huizinga’s analysis, there is something special in the intensity of play; the experience of sharing the exceptional situation is likely to promote sense of togetherness among players that leads to creation of various “play-communities” (p. 12).

Today’s digital game players are not usually wearing special clothes that set them apart, or mark them as members of a special “tribe” or community, but in special events such as gaming conventions one can often see people who are wearing T-shirts with game-related designs, or who are even dressed up as games characters—a practice that the “cosplay” (costume play) phenomenon has made increasingly popular (Rahman, Wing-sun, & Cheung, 2012). Mostly, the subcultural character of gaming communities does not carry such striking outward visual signs. As such, it is in line with many other contemporary subcultural phenomena that interest researchers.

The early studies of subcultures were focused on youth subcultures who were born in modern, urban contexts, such as “punks,” “mods,” or “skinheads.” The dominant idea was also that a subculture is something that is in opposition to the mainstream of life in a society, so “delinquent” or “deviant” subcultures were prominently featured in studies such as the collection of articles published in the seminal *Resistance through Rituals* anthology (Hall & Jefferson, 1976). Drawing upon the work carried out in the Birmingham Centre for Contemporary Cultural Studies (CCCS), the authors subscribed to a wide view of culture:

> The “culture” of a group or class is the peculiar and distinctive “way of life” of the group or class, the meanings, values and ideas embodied in institutions, in social relations, in systems of beliefs, in *mores* and customs, in the uses of objects and material life.
>
> (Clarke, Hall, Jefferson, & Roberts, 1976, p. 10)

The danger of applying such a comprehensive view of culture is that a “subculture,” too, can mean almost anything in the organization of social life and cultural expression. It soon also became clear that many interesting subcultural phenomena are not particularly “rebellious” or deviant by character. In their reassessment of subculture studies, Andy Bennett and Keith Kahn-Harris (2004, p. 7), for example, point toward how over-looked the domestic sphere was in the early subculture studies, and highlight Angela McRobbie and Jenny Garber’s contribution (1976) that focused on the strong “Teeny Bopper” culture of pre-teenage girls. Bennett and Kahn-Harris note that the researchers of CCCS rarely considered the possibility that the young people might be playing their subcultural roles just for fun, and also discuss how more recent research has addressed the fluidity and playful adoption of various subcultural signals with such concepts as “taste cultures,” “neo-tribes,” “lifestyles,” or “scenes” (Bennett & Kahn-Harris, 2004, pp. 8–14). There is, nevertheless, continuous need to address particular groupings and practices such as those of active science fiction fans or online gamer communities in cultural terms, but taking into consideration the dynamic, actively-constructed character of such phenomena.

The ethnographic studies into digital gaming (sub)cultures are expanding, but still much that is published remains as personal accounts or journalistic surveys into interesting, novel phenomena. For instance, *Dungeons and Dreamers* (2003) by two journalists, Brad King and John Borland, includes a narrative that spans from the early 1970s Lake Geneva wargamer scene to the stories of Richard Garriott (creator of popular *Ultima* RPG series, 1980–2009) and most notably *DOOM* (id Software, 1993), the first-person shooter game developed by John Carmack and John Romero. A somewhat similar, but more strongly RPG-genre-focused account is told in *Dungeons and Desktops* (2008) by Matt Barton. The game culture captured in these narratives consists of a mixture of personal histories and anecdotal evidence of game-related developments in technology, the game industry, and the surrounding society. These kinds of works often also try to provide the reader with descriptions of notable games and how players of the time experienced them. The system of thought that governs the norms, practices, and ways of speaking that these groups of people adopted nevertheless largely remain implied in the narrative descriptions in these books, rather than taken as the subject of in-depth analysis.

More analytical in approach, scholarly works, by comparison, often deliberately narrow their perspective. The *World of Warcraft* reader, *Digital Culture, Play and Identity* (Corneliussen & Rettberg, 2008) is a good example of this. The entire reader is dedicated to a single MMORPG, and rather than trying to be comprehensive or all-encompassing in their approach, each author has a particular, interpretative angle that they explore in their chapter. The “culture” of a game such as *World of Warcraft* is shown to be torn by hidden internal tensions and conflicts, such as that between the promise of playful fantasy and repetitive, gruelling “grinding,” which actually makes the game into a simulation of capitalistic, “corporate ideology” (Rettberg, 2008). Even calling these kinds of virtual worlds “role-playing games” appears questionable, as several studies point out how difficult actual role-play is in a multiplayer setting that is primarily conflict and achievement oriented (MacCallum-Stewart & Parsler, 2008; Tronstad, 2008).

Conclusion

The concept of “culture” in relation to digital games, game development, and player practices appears both important and challenging. It directs our attention to the artistic and cultural values, and to the creative expression that games are able to embody and inspire. Culture is also a key term when a more comprehensive or analytical understanding is required about games in their rich, real-world contexts.

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37

CUT-SCENES

Rune Klevjer

> The meta-question on narrative is, are we going toward this parallel model, which is "game, cutscene, game, cutscene, game"? Because it's a bit odd, if you think about it. It's an artifact from when our world was simple … The question I'm asking more is what excites me as a game developer? Exploring this space, or exploring the parallel space? The answer may be for any particular game developer, the parallel space. And God bless them. Go forth and prosper. I think, though, that games are uniquely their own media. It's about exploring the integrated space.
>
> (Ken Levine to *Gamasutra* in Kumar & Nutt, 2008)

Cut-scenes have become very much part of what defines single-player gaming as we know it, featuring prominently in leading series during the last 10 years such as *Tomb Raider* (Core Design/Crystal Dynamics, 1996–present), *Halo* (Bungie, 2001–present), *Grand Theft Auto III–IV* (Rockstar North, 2001–2008), *Uncharted* (Naughty Dog, 2007–present), or *Mass Effect* (Bioware, 2007–2012). A cut-scene is a cinematic sequence that suspends regular gameplay in order to convey plot, characterization, and spectacle. In broad gameplay terms, cut-scenes contribute to structure and pacing in story-based single-player games. They typically function as rewards for the player, as markers of progress along the way, and as regular respites from the intensity of action. As pointed out by Hancock (2002), Klevjer (2002), and Salen and Zimmermann (2004), cut-scenes may also have more specific gameplay functions, often providing information to the player about upcoming events and challenges, or catapulting the player into the thick of the action.

The video game industry, as well as game journalism and academic video game studies, has an ambivalent relationship to cut-scenes. The quote above from Ken Levine, a much-cited industry authority on how to do storytelling in games, illustrates a common critical view, which asserts that storytelling should happen within the gameworld itself rather than being added to it through film sequences. Notable examples of this design principle in recent video game history would be the *Half-Life* series (Valve, 1998–present), the *Call of Duty* (Activision, 2003–present) single-player games, and Levine's own *BioShock* (2K Australia, 2007) games.

Drawing on previous research as well as considering some notable recent developments, this essay will discuss the role of cut-scenes in games. What are their defining characteristics and key functions? What is the significant difference, if there is any, between storytelling through cut-scenes and storytelling through in-game events? Let me first give a brief introduction to the historical origins and the basic forms and functions of cinematic cut-scenes as a storytelling device.

History and Functions

Pac-Man (Namco, 1980) was the first game to include cut-scenes in the literal sense of the term: brief non-playable intermissions that “cut” away from the action to present a kind of staged “scene” depicting Pac-Man and his monsters chasing each other around. The animated intermissions in *Donkey Kong* (Nintendo, 1981) were the first to unambiguously convey a story and a plot: Kong steals the princess and Jumpman saves her.

Cut-scenes continued to play only a relatively modest role in action games during the 1980s. *Super Mario Bros*. (Nintendo, 1985), which merged adventure and platform-action into a sub-genre of its own and established Nintendo as the new king of the video game industry, did not have cut-scenes, and the cartridge ROM for the Nintendo home console system did not have much space for extravagant content anyway. Animated cut-scenes were occasionally being used in role-playing and adventure games, but the main storytelling devices were still static text and dialogue scenes.

In the early 1990s, the situation changed in two important ways. First, the introduction of the CD-ROM, especially the way in which it came to dominate the console market through Sony’s PlayStation, dramatically expanded the storage space available for video, music, and voice. It set a new standard for what players expected in terms of media content and production values in games. *Final Fantasy VII* (Square, 1997), was particularly influential in raising the bar in this respect. Its pre-rendered cut-scenes, referred to as full-motion video (FMV), were lavishly produced, cinematic-looking, and spectacular, and resonated well with the semi-3-D graphics of the rest of the game. Like the *Metal Gear Solid* series (Konami, 1998–present), the *Final Fantasy* games after *Final Fantasy VII* (Square, 1997–present) have made numerous cut-scenes and non-playable dialogue their trademark, in effect creating a kind of hybrid hypertext-game format that has a large and devoted following.

The enlarged storage space that was made available also spurred new experiments in hybrid film-game formats. *Wing Commander IV* (Origin, 1996) and *Command and Conquer: Red Alert* (Westwood, 1996) had large amounts of live-action cut-scenes, but in the subsequent years few games followed their lead. Hypertext-adventures with live-action cinematics, such as *Phantasmagoria* (Sierra On-Line, 1995), *The 7th Guest* (Trilobyte, 1993), and *Johnny Mnemonic* (cineACTIVE, 1995), also blossomed during this relatively brief period. However, their style of puzzle-based interactive cinema was not a commercial success, and the interactive movie game genre (Perron, 2007) all but died out. In recent years, Quantic Dream’s *Fahrenheit* (2005) and *Heavy Rain* (2010) can be seen as a rebirth of this rather peculiar genre of single-player gaming. However, this time around they are building their worlds through real-time graphics, which are far more malleable than canned video footage. Crucially, this also allows for avatar-based 3-D navigation, which in marketing terms has become an absolute prerequisite for any contemporary big-budget console title.

Real-time 3-D navigation was indeed the second big change for cut-scenes in the early-to-mid-1990s, driven by the emerging first-person shooter (FPS) genre. The entire range of action-adventure genres, including Nintendo’s own *Super Mario* series (Nintendo, 1985–present) and *Legend of Zelda* series (Nintendo, 1986–present), was re-crafted within real-time navigable 3-D polygonal space. The moving frames of side-scrollers, top-down and isometric scrollers gave way to a navigable virtual camera as the player’s central mode of access to game space. Hence, game space became much more similar to film space, revitalizing old dreams of virtual reality and interactive Hollywood cinema (Nitsche, 2008). Cut-scenes could now be played out in real time, rendered through the games' own graphics engines, and blended seamlessly with the polygonal graphics of gameplay. The invention of scripted real-time polygonal animation also gave birth to what became known as *machinima*, the production of animated films through in game-based real-time environments.

The Nintendo 64 console (codenamed "Project Reality" while in development) could do very little full-motion video, due to the ROM cartridges' lack of storage space. However, it was well-suited to real-time cut-scenes. Taking *The Legend of Zelda* series into 3-D space, *Ocarina of Time* (Nintendo, 1998) demonstrated how in-engine cinematics could be used very effectively, not just conveying the plot but also as a way of rewarding the player with scenes of great atmosphere and spectacle, not least by introducing a host of beautiful and terrifying bosses, and depicting each one's majestic downfall when the player had beaten them.

Around the turn of the millennium, real-time (yet fully-voiced) cinematics started to become the default choice in games across the board. *Grand Theft Auto III*, effectively laying the groundwork for a new sub-genre of open-world action-adventure gaming, was especially important in this respect. Through writing, directing, and acting at a level of quality that was hitherto almost unheard of in the game industry, and with a keen eye to the particular sensibilities of their chosen genre of fiction, the game's real-time cut-scenes significantly helped define the Liberty City world. Like the earlier *Perfect Dark* (Rare, 2000), which was also notable for its high-quality-voiced cut-scenes, *Grand Theft Auto III*'s cinematic sequences were particularly used as mission briefings and debriefings, framing each mission firmly in Hollywood's gangster mythology. At the same time, there were still notable examples of FMV in this period. The cut-scenes in *Silent Hill 2* (Team Silent, 2001) arguably have a poetic and emotional intensity that could hardly have been achieved through the available technology of real-time animation at the time.

Today, nearly all cut-scenes are generated in-game, as it costs less and is far more flexible than pre-rendered video, and also because most game developers favor a visual seamlessness between gameplay sections and the cinematics. In terms of sheer visual quality, the advanced capabilities of contemporary gaming hardware mean that there is less to be gained from using state-of-the-art pre-rendered video. During the first years of the seventh generation of home consoles, there was a marked improvement in the cinematic and artistic quality of cut-scenes in typical triple-A single-player titles, as was apparent in major titles such as *Mass Effect* and *Uncharted*. In these and subsequent blockbuster releases, continuing advances in technologies of performance capture and facial animation meant that the acting in these games could be as nuanced as that of feature films. A particular point in case is the advanced "motion scan" technique employed by the recent *L.A. Noire* (Team Bondi, 2011), a game that relies on the subtleties of facial expression as a core part of its gameplay. The *Uncharted* series and *L.A. Noire* also illustrate how games can more easily take advantage of the flexibility of real-time cinematics, by continually interspersing gameplay with micro-cut-scenes that briefly take control out of the player's hands. These can be very simple; for example, in the opening sequence of *Uncharted 2* (Naughty Dog, 2009), the playable character stumbles only slightly before he (and the player) regains control.

Efforts to make cinematic sequences playable or "interactive" in various ways has been a consistent tendency during the last ten years or so. So-called “quick time events,” during which the player must respond quickly to on-screen button prompts in order to make the scene unfold in a certain way, have seen a renaissance following popular action-adventures such as *Resident Evil 4* (Capcom, 2005) and *God of War* (SCE Studio Santa Monica, 2005). The playable real-time cinematics of *Fahrenheit* and *Heavy Rain* can also be seen as a part of this larger trend.

Finally, Bioware’s epic *Mass Effect* blockbuster action/role-playing game series is a notable development in the use of playable cinematic sequences. The *Mass Effect* games combine interactive cut-scenes with traditional dialogue tree mechanics to construct plotlines and character relationships that are configurable within a conditional branching structure, hinged around a fixed overarching storyline. Each cut-scene is composed of fixed and variable modular segments, and the different possible variants of any given cut-scene—based on the player’s choices—lead to larger or smaller variations in plotline and character relationships. Some of the consequences of such player choice carry over between games, especially between the second and third game in the trilogy.

The *Mass Effect* series is a distinct hybrid of role-playing and interactive cinema, and is significantly more ambitious (and costly) than earlier efforts in the same direction, including Bioware’s own *Knights of the Old Republic* (2003), released only four years previously. Improved facial animation technologies have been an important factor, as the majority of the cut-scenes are fairly static dialogue scenes that depend on a certain level of expressive nuance. Key to their success is the consistent use of a characteristically flat acting style, reminiscent of what you would find in plot-driven suspense series such as *24* (Fox, 2001–2010) or *Lost* (ABC, 2004–2010). This style means, crucially, that the same individual scene module—for example, a dialogue reaction from Shepard, the male protagonist—can be used in different modular configurations, expressing a different meaning each time, depending on the context of the scene as a whole. This trick, utilizing what in film is known as the Kuleshov effect, is essential to the modular configurability of each cut-scene as well as to the overall malleability of character traits and relationships.

Narrative Framing

The central concern in research focusing on cut-scenes in games—either solely or as part of a broader focus—has been what we may call the question of narrative framing. This question addresses the various ways in which narration in games—including not just cut-scenes but also other mechanisms and devices of traditional narration such as written backstory or dialogue scenes—provides “a fictional framework for you as a player to place yourself within” (Kirksæther, 1998). In a general sense, this kind of framing is the default function of narration in computer games, and cut-scenes are the default way of doing it. In this respect, the function of cut-scenes extends from the framing of the game as a commercial product, which typically situates the game in the context of a cross-media franchise or otherwise established genre fiction, such as the *Harry Potter* series or the Hollywood gangster film genre.

The way in which traditional narrative exposition contributes to situating the player’s actions and experiences in a fictional context has been conceptualized in different ways. In Henry Jenkins’s influential accounts of *spatial storytelling* in computer games (Fuller & Jenkins, 1995;

Jenkins, 2004), the key function of any pre-written exposition, cut-scenes included, is to support the narrative meanings and resonances that are being evoked by the designed space of the game. The computer game, Jenkins says, is a spatial medium, and it is through combating and exploring the environment itself—and ultimately conquering it—that the player gets to engage with a storyworld. Because this storyworld typically will be of the *transmedial* kind, either in the specific sense (such as *Star Wars*) or in the more general sense as a piece of genre fiction, the chance to explore and immerse oneself in a familiar fictional world is more important than the specifics of the plot.

However, though Jenkins recognizes the need for traditional narrative exposition in games, in a supporting role, he does not think that cinematic cut-scenes have much of a role to play. On the contrary, echoing Levine and others from ten years later, Jenkins argues that because they are non-playable and "static" film clips imported into game space, using cut-scenes to convey plot is a sign of artistic immaturity, and that they eventually should—and will—be superseded by storytelling techniques that are more integral to the medium.

Paul Cheng, in his discussion of the nature of cut-scenes (2007), which broadly shares Jenkins's perspective on spatial storytelling, draws the opposite conclusion: the formal tension and seemingly crass hybridity of cut-scene-based gaming, rather than being artistically immature, has been developed into language of its own, with its own rules and conventions, and has become central to inscribing game experiences into broader transmedial narrative contexts. Drawing on the classic work of Marsha Kinder (1991), Cheng points out that hybrid and multimodal interpretative competency is one of the central marks of transmedial popular culture. This idea that the interplay between cut-scenes and game-playing has a language of its own, and should be seen as a distinct mode of expression, is also advocated by Matthew Weise (2003). Using famous examples from *Final Fantasy VII* and *Metal Gear Solid 2*, he specifically points to the inevitable *tension* between playing and watching as a unique source of creative expression in video games.

Hybridity and tension, in other words, need not be a bad thing. Like Weise and Cheng, I would argue that cut-scenes contribute to narrative framing in their own *specific* way, that is, not only in terms of their general function as devices of narrative exposition. Although one could say that cut-scenes are overused, and though they are often used in lazy ways, as a convenient way of conveying plot and packaging a spectacle, they nevertheless bring something unique to the messy blend of forms and techniques that makes up computer game language.

As I have argued previously (Klevjer, 2002), and on this point I agree with Jenkins and others, the central role of cut-scenes is not their capacity to convey a plot—although they are undoubtedly a highly flexible and potent instrument in this respect—but to contextualize the events in the game in the familiar tropes and mythologies of genre fiction. While familiar and ready-made storyworlds are indeed being evoked through the style and affordances of the environment itself, as well as through the nature of the challenges presented to the player, cut-scenes are able to convey what I have referred to as the familiar *voice* of a genre. In other words, they bring with them, in a way that scripted events and other forms of in-game storytelling cannot, a rhetorical dimension to the gaming experience. Cinematic cut-scenes, when used to their potential, establish a dialogue or conversation between the actions of the player and voice of a narrator. This conversation echoes the relationship between the player and the imagined designer that is so characteristic of the single-player computer game experience (What do they have in store for me next? What is the significance of this object?).

To the extent that the player's actions are being framed by this conversation, we may say that the actions are also enactments, imbued not merely with narrative or dramatic meaning in the general sense, but more specifically with spoken meanings, narrated meanings. Again, the signifying potential of framing by cut-scenes is not primarily on the level of plot, but on the level of genre and the mythological; when I play, I am being addressed as a typical subject in a typical world. My own actions speak to me in a voice that is not mine.

Cinematic Space

The rhetorical perspective, however, does not address the very particular language of *cinematic* narration. Let me suggest, taking a cue from Ken Levine and others, that we look at cut-scenes essentially as pieces of cinema rather than essentially as non-playable sequences, which means that we define the nature of the cut-scene primarily in terms of space rather than in terms of agency or lack of agency. A cinematic cut-scene suspends regular game space and hence regular gameplay. "Regular" space, then, is what Levine calls "integrated space," as opposed to the "parallel space" of cut-scenes. Although Levine is hardly launching himself as a video game ontologist, I would argue that his basic conceptualization is right on the money, even if one might disagree with his conclusions with respect to the role and functions cut-scenes in game design. Cut-scenes bring cinema into the game.

In a cut-scene, the virtual camera is a *movie camera*, setting up time-space according to the conventions of cinematic fiction. The movie camera speaks through a repertoire of expressive movements (tracking, panning, etc.), framings, and focal techniques. Most importantly, it operates through cuts in time and space, which typically follow the conventions of continuity editing. The aim of this kind of camera, whether in a movie or in cut-scene, is to enable the viewer to project an imagined space. This projected space is not an environment made up of locations, sets, and actors, but a world—a complete world—of lives and stories. This world is, following Gerard Genette's classical model (1980), a *diegetic* world, which is spoken or more precisely *told*, in the sense that it is projected through narrative discourse, uttered in the elaborate language of cinematic fiction.

So although *Quake* (id Software, 1996), *Tomb Raider*, and *Super Mario 64* (Nintendo, 1996) took us into what we may call *cinematographic* space in the 1990s—space as constituted through a camera lens—this space still stands in sharp contrast to the imaginary space of cinematic fiction, which is projected through the ephemeral omnipresence of the movie camera. A player-controlled navigable camera is the movie camera's ontological opposite. Its function is not to narrate an imagined world, but to extend the player's audiovisual apparatus into synthetic space generated in real time (Klevjer, 2012). Whether the camera is directly navigable, as in a so-called "first-person perspective," or merely indirectly navigable via the playable character—or both at the same time—its defining function is to be an avatar in the true sense of the term, an embodied incarnation, a "camera-body" (Rehak, 2003) that mediates the player's simulated presence in game space. Insofar as there is storytelling going on in this avatar-based space as well, it will also project its own diegetic world, a world of characters and their stories rather than agents and their behaviors. Still, the environment itself, the three-dimensional space of player participation, is definitely not a world projected in imagination—at least no more so than the world outside the game.

What is sometimes called "in-game" storytelling, then, which is a notion that seems to refer more to the game *engine* than to the game structure, are techniques of dramatic orchestration that make events unfold within embodied synthetic space. Such events may be more or less "integrated" in gameplay terms, as in *Bioshock*, but they may also be staged as purely navigable dramatic scenes that have no particular gameplay function, as exemplified by some of the scripted sequences in the *Half-Life* series or *Call of Duty* series.

In terms of historical origins, the understanding that I am proposing here implies that the early pioneers such as *Donkey Kong* and *Pac-Man* must be seen as common predecessors to what has later bifurcated into cut-scenes and scripted events. Although as a heuristic exercise, it would be tempting to speculate that whereas *Donkey Kong* primarily points toward scripted events and in-game drama, the romantic cut-scenes in *Pac-Man*'s follow-up, Ms. *Pac-Man* (Namco/Midway, 1981), point toward the diegetic space of cinematic fiction.

With respect to the shift to real-time generated cut-scenes, while this did not change the relationship between cinematic space and avatarial space, the new verisimilitude implied by shared virtual cinematography was nevertheless significant. As mentioned above, it implied more flexibility to rapidly jump back and forth between the two spaces, as the cut between them was no longer immediately apparent from the quality of the image itself. This can lead to interesting ambiguities, especially when there is a loss of player control but no apparent independent camera movements to match, as in the stumbling example from *Uncharted 2* above, or, vice versa, when the player still controls the playable marionette but the camera nevertheless moves in independent ways. Variants of the latter principle, which can have quite unsettling effects, can typically be found in horror games, such as *Silent Hill* (Team Silent, 1999) or *Eternal Darkness: Sanity's Requiem* (Silicon Knights, 2002).

Companionships

By bringing the language of the movie camera into the game, cut-scenes attempt to evoke not only the mythology and imagery of cinematic fiction but also its characteristic ontology, its flavor, and its tone. The in-game approach and the cut-scenes approach are two very different mechanisms of narrative framing, and one cannot be a substitute for the other. A key difference lies in the role and function of characters. By its very definition, diegetic storytelling projects characters as having a complete and autonomous existence, as *persons*, who act independently and intentionally, who have goals and hopes, who have a history, and who express their inner lives.

The aim of the in-game approach to storytelling is to construct characters not primarily by narrating them, but by expressing them through player-controlled marionettes, AI agents, dialogue structures, and scripted events—as if the player is actually getting to know them first-hand. The cinematic approach to storytelling, in contrast, allows characters to live in an imaginary world that is separate from the player's experience in virtual space but that unfolds in a mirroring relationship to this experience. If well designed and well told, there will be meaningful and compelling resonances between the player's story and the characters' story, between my drama *here* and their drama *there*. Successful games are able to establish, given enough time and dedication on the part of the player, a dialogue between the journey of characters and the journey of players, a companionship, a bond across the ontological divide, emerging from shared histories and common destinies.

Finally, how can the imaginary world of cinematic narration be made playable? The simple answer is that it cannot, because it is produced in discourse and hence beyond the realm of viewer or reader agency. Still, there is always the possibility to interact on the level of cinematic discourse itself, in other words to tell a different story, choose a different ending, or play around with possible configurations of the plot. So even if, in cut-scenes, characters and events are out of the player's reach, inaccessible, or "off-line," in James Newman's terminology (2002), they can nevertheless be *indirectly* playable in all kinds of ways. An imagined world of characters and events may be narrated in user-malleable and multi-stranded ways, but the chosen paths and configurations will nevertheless be spoken back to the player through the language of cinematic fiction. Enjoying games such as the *Mass Effect* series, therefore, where the parallel space of playable cut-scenes is unusually dominant and complex, may not be very different from the enjoyment reported by writers of literary fiction, who find that their own characters start speaking back to them as autonomous persons, going about their own ways.

To conclude: Levine is right in that cut-scenes are indeed a parallel space. But bringing cinema into the game is not simply a matter of convenience. Cinematic fiction is a unique form of narrative framing that has been continuously developing over 30 years of single-player gaming, and that expands the scope and depth of artistic expression in games.

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38
DEATH
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Video games simulate real-life experiences in many respects even though the environments in which we play are often based in a fantasy world, a science fiction world, or in historical settings. Games can be used as a laboratory for experiences, some we will never encounter in real life, and some we have to face in the future. As death is an experience we cannot speak about after we have faced it, it is a concept that is very difficult to grasp. Fingarette (1996, pp. 1–5) describes death as an empty concept that has no meaning in itself but needs to be interpreted by its rituals, symbols, and contexts in which it is embedded to make it meaningful. He describes death and its rituals and contexts as a building on which many perspectives are possible: “There are as many correct perceptions of that building as there are perspectives from which to view it” (p. 85). Death itself seems to be at the center of this building, hidden from the outside. Those of us who grew up in a Western culture, and have not experienced war, have rarely been present at the moment of death of a close friend, family member, or even a beloved pet. Dying is something that happens behind closed doors, often in special institutions but rarely in one’s own bedroom or living room with family members all around one. At the same time, while this experience is being hidden from our everyday life, death and the fascination with it can be observed in digital media, such as the *coffin cam* online on the See Me Rot website, which claimed to have installed a camera in a coffin, filming the decomposition of a dead body and sending the data out to everyone interested watching it via the Internet; or the Facebook application *If I die*, which claims to offer a way to send comments and post on your friends’ Facebook walls long after your death. Both the *coffin cam* and the *If I die* application are discussed online to be hoaxes. Whether the *coffin cam* did exist and film a real body, or the *If I die* application is really in development, is less relevant for this essay than the fact that they are representations of new ways of approaching death. Another example is the *iDeath* calculator available via iTunes calculating the user’s predicted date of death. Avatar-based video games do not only let us watch dying and death but we actively are involved in the death of our own avatar or those of others. This opened a never-ending debate in the media based on the visual aesthetics of death and killing in games. This debate clearly shows that before even asking about the function of death in video games, a moral statement and judgment is sometimes made without an understanding of the complexity of this topic.

This essay reflects on death, dying, and suicide in video games and points out the functions that these activities have in many video games. Indeed, we experience the death of our own avatar while playing when we kill or are being killed by non-player characters and other players’ avatars.

Death

Death is not only a topic in video games but in board and card games as well. The best known board game is probably the war game, chess. However, many other board and card games are played around questions of death and dying (Lange, 2002, p. 94), such as the board games Game of the Goose, backgammon, or the card game War.

The difference between those rather abstract representations in board games and card games and the representations in video games is that in the latter we are explicitly confronted with death. As graphic card games now offer more and more film-like representation, violence, death, and dying are also more clearly represented and not in only an abstract way. While playing chess, we also attempt to kill our opponent's army, yet this does not lead to heated discussions about violence as the killing in a first-person shooter does.

An observer just watching (and not playing) could compare the visual experience with a movie and wrongly align the experience of watching a scene in game to his or her prior filmic experience. In story-based games the player might identify with a nonplayer character and mourn his or her death as in *Final Fantasy VII* (Yoshinori Kitase & Hironobu Sakaguchi, Square, 1997) the moment Aerith is killed. This moment has been described on the IGN Entertainment website, a provider for reviews and discussions about video games, as number 1 of the top 100 video game moments:

> Death happens all the time in videogames. In *Call of Duty* it's a slap on the wrist, in *Dark Souls* it's education, in *Pac-Man* it's another coin for the machine. In *Final Fantasy VII*, though, one death is a genre-defining moment: Aerith Gainsborough's.… what hit so hard about Aerith's death … was the fact that you, too, had known her, had invested all that time and energy in her, only for her to be suddenly taken away. There is no moment in gaming's emotional journey from kids' entertainment to modern storytelling medium that has endured as strongly as this.
>
> (http://www.ign.com/top/video-game-moments/1)

Aerith's death is the loss of a game character who was central to the storyline of *Final Fantasy* therefore her death has been deplored by many players. However, while a movie and a story-based game intend its observers to emotionally connect to the protagonists and immerse them within the narrative, many other video games, such as multiplayer games, do not ask for immersion and empathy in the same way. As in the playing of chess, such games ask instead for a strategy to win and to control the action.

The implementation of death into games has a specific function. In the case of arcade games in the 1970s, the implementation of death has economic reasons as Lange (2002, pp. 96–97) shows. As the investment in arcade machines was very high—they were very expensive—the investors looked into opportunities to make money out of them; therefore playing time has to be restricted. This happened by increasing the difficulty of the game after a few minutes and led to "game over" or to the death of the player's avatar.

The implementation of death in mainframe games, such as those on the PLATO system such as *Maze War* (Steve Colley, 1974), an early first-person shooting game in which players could interact with each other online, has a different function. Even though the avatar in this game is not a full human body but a human eye, being shot by another player leads to “game over.” “Game over” can be different from the avatar’s death as it ends the game for the player, but death is not necessarily involved. The player is being pushed out of the game, which has an effect on the ludic experience, but this does not mean that the game’s narrative is changed. But the death of the avatar has an effect on the game’s narrative. The avatar in early games was not an anthropomorphic figure or part of a storyline, but often only a spaceship or a cannon; “death,” then, was the loss of a spaceship. The spaceship’s passengers were not visible, and the question as to whether a spaceship required a commander within the game world was not relevant. Central to gameplay were objects that the player could manipulate during interaction with the machine. Concepts as “life” or “death” were used only metaphorically. The first game showing the death of a human-like avatar was *Gun Fight* (Midway, 1975). When the avatar died, the text “got me” appeared (Figure 38.1).

“Got me!” reminds us of children’s games as hide and seek or chasing each other, but not of killing. If we want to speak about the death of an avatar in *Gun Fight*, it is more like “playing dead” than being dead. The player could continue playing by inserting another coin into the machine. Therefore, there is no finality regarding the death of the avatar in *Gun Fight* or other arcade games. This tradition can be traced to recent video games in which the avatar can also resurrect on the spot or from the last save point so that the player can continue playing.

Figure 38.1 An avatar dies in *Gun Fight* (1975).

The representation of death in video games has changed a lot since rather abstract human stick-figures were being shot or run over. The graphic representation of human figures has become more and more photorealistic and cinematic representations of death and killing are now the norm in action games produced for adult gamers. The violence being explicitly shown in these games can be shocking as in the survival horror action game *Dead Space* (EA Redwood Shores, 2008) and its sequels *Dead Space 2* (2011) and *Dead Space 3* (2013). While *Dead Space* is situated in a science fiction world and the enemies attacking are aliens, other games show fights between humans and situate these fights in cities such as New York in *Max Payne 1*

(2001) and *2* (2003) and Sao Paulo in *Max Payne 3* (2012; all Rockstar Studios). The introduction of slow motion in these fight scenes in the *Max Payne* series (so-called bullet time) made it possible to show the flight path of a bullet in slow motion but this also has an impact on the visual representation of the body hit by this bullet. The player can watch the bullet penetrating the body and blood surging from the wound in detail, and in slow motion as well. Fictional game worlds, as in science fiction or fantasy, put the representation of death into a sphere distant from the player's experiences outside of the game. The photorealistic representation in action games such as *Max Payne 3*, however, are set in the simulation of a real city and deal with such topics as the divide between the rich and the poor, corruption, and organ harvesting, and are therefore closer to the player's real world. What sets these action games apart from players' real experiences is the fact that in all these games the player's avatar can only survive by causing the death of others. While the death of the non-player characters is usually final, the death of the avatar is not.

Dying

When we play a new game and are not skilled yet, we are forced to watch our avatar die over and over again. These deaths, then, have a didactic function and take place on the ludic level of the game and not on its narrative level. Dying leads to "game over" when the player is pushed out of the game but he or she is still may be able to re-enter and replay the game. Playing a game means, in most cases, to develop our avatar further, to learn to control the game, and to adapt our actions to the affordances of the game software. This can be compared to a process in which the player is asked to improve his or her skills, or, to put it differently, to submit to the rules of the game, internalize them, and follow them. Internalization of the game rules is rewarded with staying alive. Grodal (2000, p. 203) has shown that "the sense of realism is enhanced because the player's control is not absolute but relative to his skills." While the player partly gains control, the game controls the activities of the player. The possibility of replaying a sequence to improve one's own gameplay does not only give the impression that the player gains control but it also controls the actions of the player and establishes a functional circuit between player and game. Staying alive is rewarded by being able to enter the next level, improving skills, gaining experience points, or reaching a higher rank in a game. Dying results in punishment by losing experience points or the rank and the status related to it, paying for damaged equipment or for a soul healer to retain the full functionality of the avatar in game again. Following Nohr (2012, p. 67),

> [t]he player subordinates to a routine of repetition that is on the one hand technical (insofar as the program defines the parameters that have to be reached in order to display the visual representation of a successful jump) and on the other hand also reaching in to fields of social and cultural meanings. The player subordinates willingly to a procedure of optimizing his or her actions—a *self-optimization*.

Playing a video game includes several decisive moments a player has to solve by using a trial-and-error method. In a situation where the player makes a wrong decision or lacks the skills to solve a problem, the avatar dies. This does not end the avatar's existence since games, as we have previous noted, offer a “replay” function through resurrection or revitalization of the avatar. The experience of a player with a video game can be described as a playful encounter of death and dying. A player plays through several deaths of his or her avatar. These are symbolic deaths comparable to those in comics or movies, as we do not speak about physical bodies here or about an irreversible state.

Using an avatar as a tool to play a game helps the player to become immersed into the game world and become a part of it. The avatar’s death turns out to be a disruptive factor for the player’s immersion, and the game’s narrative experience, in those games in which a narration is integrated. An identification of the player with the avatar breaks down in the moment of the avatar’s death (Neitzel, 2008, p. 158). The player reacts to this with irritation or a shrug of shoulders, depending on what the in-game consequences look like. For most single-player games, dying means to go back to the last save point, and gained points and items are lost and need to be gained again. For a multiplayer game, such as a massive multiplayer online role-playing game (MMORPG), experience points and sometimes also equipment is lost, or at least becomes broken and needs repair. Furthermore, the death can affect the group a player plays with, and all group members might die as result of the death of one avatar or lose points. The death of the avatar is a loss, but mainly a loss of time and money. Both are annoying, rather than a reason for mourning.

Challenge Mortality

The omnipresence of death and dying in video games can be seen as based in the computer’s ontology. If we understand the computer as a simulation machine, then we can challenge the concept of mortality. While symbolic representations of death in novels or movies allow for an imaginary examination of death and dying and philosophical questions of mortality, video games differ in their death simulations. They hinder this reflection and examination because of their replay function, as this highlights repeatability without consequences. What games add, however, is the observation of one’s own death, even though it is just one’s own avatar dying. As the player is still able to resurrect and continue playing, death is connected to control and becomes an insubstantial obstacle, as reflected in gaming practices such as the committing of suicide in games. The number of suicide gaming videos on YouTube shows how the experience of dying is central for some players, who try to find out how many ways there are to die in a game. These documentations are combined with an entertaining soundtrack and funny comments. This can be described as counterplay, a concept that is used to describe a way to play a game against its rules or against the intention of the designers. Counterplay means using the built-in game algorithm not for solving tasks given by the game, but using the game for something else than what it was designed for. Instead of fighting monsters or another team of players and submitting to the game’s affordances, players can use the game environment for different performances, taking over control and exploring how else the game environment can be used. Being in control, while deliberately facing the loss of control, is central for in-game suicides. This can result in pleasure, as is shown in suicide gaming videos.

Serious Ends

While most video games do not challenge the player with thought-provoking philosophical questions about mortality, Preloaded Studios' free online web-game *The End* (2011) offers a different approach. Mainly addressing players in their teenage years, the game is designed to make its players think more about complex questions concerning mortality. The game starts with the avatar's death and gives different options as to what might follow after death. Death is a central topic in this game and players are asked to reflect on death instead of playing with it as we do in most video games. The player is not only asked to collect "death objects" and will come across "keys of knowledge" represented by quotes, such as Somerset Maugham's "dying is a very dull, dreary affair and my advice is to have nothing to do with it." Later on, the player is asked to answer questions such as "Is there such a thing as a cause worth dying for?" and "Can we understand what death is actually like?" The answers to questions about death help to construct an explanation of death based on the player's decisions.

The End is not the only game that treats death and dying differently from most video games. The discussion about death in video games being final under the term "permadeath" is well known in gaming communities. A few games are exceptional as they include permadeath of an avatar—as in *Minecraft* (Markus "Notch" Persson, 2009), *Diablo 2* (Blizzard Entertainment, 2000), and *Diablo 3* (Blizzard Entertainment, 2012) in their hardcore mode. This is discussed by players, not so much from the perspective of a loss of someone close (death and mourning), but rather as a loss of a toy you paid a lot for and invested a lot of time in developing it further. The fact that this toy is taken away from the player leads to anger and discourages further play. Especially for games that have been purchased or paid for with a monthly fee, this is considered a loss of money, and all the hours invested in levelling an avatar are lost if permadeath is applied. In *Diablo 2* and *3*, the loss is a loss of an avatar, though there are still other avatars to play with, so this hardcore mode does not lead to a final end of playing the game. This is the case for other games as well in which the player plays with a group of avatars and permadeath only affects one avatar but not the whole group of avatars, so that the game can still be played. As Bartle has shown "existing virtual world culture is anti-PD [PD = permadeath]" (Bartle, 2003, p. 444). Permadeath is experienced as a penalty and treated as such. It is not treated in a way we would react to death in our lives outside of games. Permadeath adds a new rule to the game, which denies replay. This also means that the possibility to improve one's own gameplay is denied.

Conclusion

The presence of death adds to the experience of a game as a world, and its worldness (Klastrup, 2008; Krzywinska, 2008). The functions of death in games ask for a deeper analysis. Death and dying as punishment, and staying alive as reward seem awkward, if we consider games a simulation of real-life experiences. Reward and the experience of success could also be achieved differently, for example, by exploring the game world or in online games by becoming part of a game community. This relates back now to the opening of this essay in which I tried to point out that the simulation of death in a safe and seemingly controlled environment has an important function for the individual and can be compared to similar symbolic representations of death. The experience of death in a safe environment without any serious, lasting consequences and its reversibility gives the impression that we are in control and can live through an experience that in real life is neither controllable nor reversible. It is the fascination and fear of death that seems to be unbearable in real life when we are confronted with the loss of a loved one, but that, when it occurs in-game to one's own avatar, does not have a major impact emotionally.

The player is able to interact with a concept that many people do not like to contemplate in real life and observe their "own" death from the perspective of an observer. Dying in video games is the result of a failure and can be controlled by improving one's own playing skills. Whenever an avatar dies in game, the player's immersion within the game world is disrupted and the constructedness of the world is foregrounded. This offers the possibility to understand the way we conceptualize our real life, its rules, conventions, and its limitations as well.

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39

EDUCATION

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Introduction

There is a strong interest in video games from the discipline of education. Although education is often thought of solely as primary or secondary, formal, or school-based learning, education in this context refers to any situation in which knowledge is being acquired or shared across a person's lifespan. Video games in education could refer to high school students learning chemistry as a part of the curriculum, it could mean police officers learning advanced tactical skills, or it could refer to the affective or cognitive impact of multiplayer games on users who play at home for their own enjoyment.

Given this broad definition of learning and/or teaching, it is not surprising that those interested in education and video games study them from a variety of fields and a bring a multitude of perspectives. It is not uncommon for a conversation on the educational aspects of video games to have participants from computer science, psychology, teacher education, communication, sociology, anthropology, engineering, business, and health. Much like the proverbial blind men and the elephant, each perspective attempts to understand the various educational aspects of video games.

Growth of Interest in Games

There has been a tremendous, recent growth in the number of conferences, journals, grants, and even government agencies interested in the topic of educational video games (Ferdig, 2007). There are least four reasons for this rapid growth. First, researchers have provided theoretical and empirical evidence of the value and impact of video games on learning (Gee, 2003; Ferdig and de Freitas, 2012). That impact can be positive (learning content matter more efficiently) or negative (learning violent behaviors), but data are demonstrating that learning is happening. A second reason is the growth of free and open-source tools that are available for educators and students to create video game and video game environments. *Alice* (www.alice.org), *Microsoft XNA* (www.microsoft.com/xna), and *Scratch* (http://scratch.mit.edu) are just a few of the game generation tools used by students of all ages in class and at home.

A third reason is the increase in both availability and use of video game systems and delivery mechanisms. Users of all ages have a multitude of gaming options ranging from PC to Mac-based games, from PS3 to Xbox 360 to Wii, and from playing inside a web browser to playing ubiquitously on their iPhone or Android mobile device. One study reported that gameplay was almost universal among teens, with half of the teens studied saying they play games every day (Lenhart et al., 2008). A similar report suggested more than 50 percent of adults play video games, with one in five adults playing every day or almost every day (Lenhart, Jones, and Macgill, 2008). One sample massively multiplayer online role-playing game (MMORPG), *World of Warcraft* (Blizzard Entertainment, 2004) had amassed over 10,000,000 subscriptions by 2012 (www.mmodata.net/). The argument here is that if people are playing games, then researchers ought to figure out if they are learning from them and what they are learning from them.

A final reason for the recent increase in learning about education and games is the often-negative media reports about the impact of gaming. These reports frequently refer to addiction, where players have died from playing too long without a break, have committed suicide after losing their on-screen persona, or have neglected and thus harmed others because of their lack of focus. More recently, these reports have centered on random acts of violence and the role of video games in the perpetrator's life. For instance, after the Columbine High School shootings in the United States, reporters asked whether video games could have been at least partially responsible for the mass killings (Pooley, 1999). With the 2012 deadly US shootings at Sandy Hook Elementary School in Newtown, Connecticut, the interest in understanding the connection between gun violence and violent video games has been renewed. In the end, there is evidence on both sides of the debate. Some have provided research evidence that "exposure to violent video games is a causal risk factor for increased aggressive behavior, aggressive cognition, and aggressive affect and for decreased empathy and prosocial behavior" (Anderson et al., 2010, p. 151); others have suggested that "media violence may provide an outlet or release for aggressive drives. As such, people who consume violent media would be expected to become less aggressive" (Ferguson, 2009, p. 43). A *Washington Post* blog analyzed data from ten countries to suggest "there's little or no link between video games and gun murders" (Fisher, 2012). Regardless of the outcome, the debate has re-energized interest in what can be positively or negatively learned during game play.

Game Consumption and Creation

Much of the educational interest in video games has focused on consumption and the pedagogic value of play. For instance, popular theoretical approaches to cognition have highlighted play as a safe, motivational environment for learners to apply knowledge and practice skills (Vygotsky, 1967; Bettelheim, 1987):

> Video game play (consumption) provides a point of interaction between learning and doing; it can enable the practical application of concepts, skills, and knowledge. Electronic games also offer added features of automation and complexity. Since play within electronic games includes interaction mediated through electronic hardware such as a computer or gaming console, the application of games rules are applied automatically through the electronic hardware.
>
> (Ferdig, 2012a, p. 179)

The type of game consumed often depends on the perspective of the person who is interested in what is being learned. For instance, a psychologist or sociologist might be interested in the impact of games that are chosen by and played by teenagers. In this sense, the game is not an intervention with a prescriptive value but rather an object that is being observed or evaluated. Conversely, a high school classroom teacher might have a specific end goal or objective and would pick a title that was most relevant to the lesson. In these latter cases, educators will often choose between educational games (sometimes referred to as edutainment games) and commercial-off-the-shelf (COTS) games. Education games are ones that have been developed with particular learning or teaching goals in mind. For instance, *Math Blaster* (Knowledge Adventure, 1989) was created with the sole intent of helping students learn math. COTS games are those that were usually not created with a specific educational objective but can be applied as such. For example, a teacher might incorporate *Civilization* (Microprose, 1991) to teach history or social studies (Squire, 2006). Commercial games typically have a higher production budget and will thus often have better graphics or more features for players (Kickmeier-Rust, Mattheiss, Steiner, and Albert, 2011). Students often choose to play these of their own accord, thus making integration with COTS somewhat easier. A disadvantage of incorporating COTS in traditional educational environments is convincing parents, teachers, and administrators of the value of noneducation-based video games.

An additional term that deserves mention is the notion of the "serious game." Although there is some debate about when the term first appeared, one early citation comes from Clark Abt in a book he wrote in 1970 called *Serious Games*. The term then regained popularity when the Woodrow Wilson Center for International Scholars created the Serious Games Initiative in 2002. There is not one clear definition of the term; it is often defined in the context in which it is used (Ferdig, 2012b). For instance, people have described it as *advergaming* (advertisement), *edutainment* (education), and *exergaming* (health and wellness). They have also used the terms *gamification* (where developers apply game mechanics to non-game settings in order to improve outcomes), *smart gaming* (using higher order thinking and strategies to achieve game objectives), and *social impact gaming* (using games to achieve a desired social change). Perhaps at its most basic level, a serious game is one that has been designed for a reason other than to just entertain, regardless of the field, motivation, or context for which it was created.

The educational use of games is not limited to consumption. Research and training has also focused on the development of games, particularly through some of the aforementioned free development tools such as *Scratch* (MIT Media Lab, 2006) or *Alice* (Carnegie Mellon & University of Virginia, 1997). Developers, whether they are teachers or students, end up having to learn the content and skills being taught in order to prepare and create a meaningful and engaging game environment for others (Kafai, 1998). Through development, learners have the authentic opportunity to create artifacts that demonstrate their learning and provide opportunities for others to learn (Ferdig, 2006). Applications of game development could include teaching teachers to create games for their students, the use of game development for therapeutic counseling, or the use of student development for skill or content acquisition.

Tied to this notion of development is the concept of *modding*. To *mod*, short for modification, is to take an existing game and to change the content or to build a new game based on the existing game engine. Instead of developing from scratch, modders are given a scaffolded framework by which to build, rebuild, and edit. Steinkuehler and Johnson (2009) argue that modding is an example of redefining "computer literacy as computational literacy, authorship as collaborative and negotiated rather than individually achieved, and digital media literacy practice as one involving design and production, not merely passive or critical consumption" (p. 53).

Research on Educational Gaming

Given diverse perspectives, interests, and motivations for its study, it becomes increasingly difficult to ascertain what the research tells us about educational gaming. Researchers in almost all fields seem to agree that more studies need to be conducted. However, to understand the impact of education games, one has to examine the discipline, context, and purpose in which the game is used or the study conducted. For instance, researchers interested in educational game design have demonstrated the importance of aligning content, learner characteristics, and pedagogy (Ke, 2009). Psychologists have argued that children, particularly males, need outlets to explore dark topics in a healthy manner (Olson, 2010). And, medical researchers claimed that a lack of "appropriate supervision of video games use during adolescence, a crucial stage of development, may lead to serious behavioral consequences in some adolescents" (Colón-de Martí et al., 2012).

Within the field of education, meta-analyses of existing literature have been completed in order to both point out prominent features of educational games and to set the stage for understanding where the field is at and where it needs to go. Two meta-analyses examined the concept of serious games; the first appeared in the *Journal of Computer Assisted Learning*. In that article, Giarard, Ecalle, and Magnan (2012) analyzed research on serious games (SG) vs. traditional video games (VG). In the study, the authors stated: "the only difference between a SG and a VG lies in their intended purpose: usefulness for the former, entertainment for the latter" (p. 4). Through a data collection and analyses procedure, the authors found nine studies and eleven games (6 SG and 5 VG) that fit the randomized control trial methodology they were seeking. At the conclusion of the study, the authors stated that SGs might be useful for learning, but more studies were necessary, particularly longitudinal ones that assessed long-term outcomes. Perhaps more importantly, the authors reiterated what they learned in the reviewed studies:

> [T]oday's young adults, adolescents and children are very used to and motivated by VGs and educational applications … playing this type of game could constitute a support for learning when traditional teaching methods are too boring … It also allows learners to explore environments that are inaccessible to most people (such as the ocean floor or outer space) and gives concrete form to certain abstract problems such as mathematical equations, thus opening up new learning possibilities for students. These potentials illustrate why it is important to continue to study the effectiveness of SGs on engagement and the associated learning effects.
>
> (2012, pp. 10–11)

A second example meta-analysis was published in the *Review of Educational Research*. Young, Slota, Cutter, Jalette, Mullin, Lai, Simeoni, Tran, and Yukhymenko (2012) explored whether video games were tied to academic achievement when they were used in the K-12 curriculum. The authors had to contend with important issues facing those who study educational games. For instance, what is fun and what is a game? They then divided the articles that met their criteria into specific content areas. One of their important findings was that each video game had affordances and constraints based on the content area in which it was implemented. A second was that video games were useful in the classroom when they accompanied good teaching. There were some content areas that were lacking in high quality educational game research while other content areas provided sound, comprehensive research. For instance, they suggested "more time must be devoted to the topic of science-based video gaming before larger trends regarding their impact are revealed" (p. 73); however, they added that "video games to teach language in varying forms may be the most effective use of educational computer gaming to date" (p. 74). "Much as with language learning, video games in physical education have been found to have a net positive effect on students' motivations toward PE and exercise" (p. 77). Perhaps the most telling evidence from this meta-analysis on educational games was something that Ke (2009) had also pointed out earlier about alignment:

> [T]here appears to be a disconnect between the possible instructional affordances of games and how they are integrated into classrooms. Games are often multiplayer and cooperative and competitive; they engage players in several hours of extended play, allow rich "hint and cheat" websites to develop around player affinity groups, and are played from weeks to years. However, most schools trade off extended immersion for curriculum coverage, individual play, and short exposures, goals that are not well aligned with engaging video game play.
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> (Young et al., 2012, p. 80)

The pedagogy of the classroom does not often match well with the theories of engagement, learning, and action prevalent in COTS. As such, educational game developers might often find themselves creating a game with a pedagogical approach to fit the classroom; that pedagogical approach may or may not find aspects of quality game design.

The Future of Educational Gaming

The future of educational gaming could be significantly positive. Although the research field is still lacking the requisite number of quality publications to support its case, there is promise in the publications that do exist. The fact that there are journals aimed at game-based learning (such as the *International Journal of Games and Computer-Mediated Simulations*) is evidence the field is ready for researchers who can rigorously examine video game implementation. In order for this promise to become reality, there are at least three key themes that must be considered.

First, it is worth discussing Shulman's (1986) concept of *pedagogical content knowledge* (PCK). PCK is an understanding that knowing how to teach (pedagogical knowledge) is different than knowing a content area (content knowledge); both are different than knowing how to teach that content (pedagogical content knowledge). The same is true with educational gaming. A game type (such as shooter or strategy or puzzle) might have varying affordances or constraints that make it more or less useful for certain aspects of learning (such as skill, attitude, or fact) in different contexts (single player vs. multiplayer, console vs. handheld, haptic control vs. PC keyboard) for given content acquisition (math vs. science, police training vs. business simulation).

Tied to that is the second theme, that there is no silver bullet. Media agencies often request press releases or on-record statements that clarify once and for all that video games do or do not lead to violence, do or do not impact a content area (such as one's health or one's knowledge of science), or positively or negatively impact learning. Such a statement can never be made. Games are designed differently, with different purposes, goals, objectives, and audiences. They are implemented differently by various people in distinctive contexts and circumstances to meet unique goals and outcomes. As such, it is very likely that one educational game will be used successfully by one person and not another, in one context and not another, and with negative outcomes in one case and positive consequences in another.

The point of understanding both of these themes is to realize that the question for educational gamers is not "Does this game work?", but rather "*Under what conditions does this game work?*" (Ferdig, 2011). Attempting to understand the broader field of educational gaming would then begin with questions such as:

- Under what conditions do violent video games lead people to aggressive behaviors (vs. do video games cause violent behaviors)?
- Under what conditions do COTS games support physical education (exergaming) in urban elementary schools?
- Under what conditions does gamification of online graduate courses lead to improved motivation in nursing students?

A final theme that will impact the future of educational gaming is the relationship between commercial and educational entities. As noted earlier, educational groups do not necessarily have the skill-sets or the financial backing to create educational opportunities to compete with commercial successes. Arguably this may be changing with the onset of small or mini game/application development and deployment (such as an iTunes application). However, much could be learned from both educators and commercial companies that would positively impact both groups. Educators would have the opportunity to produce games that meet their learning goals; commercial groups would enjoy the benefit of potential improved success drawing on what educators from all fields know about how, what, when, where, and why gamers learn from games.

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40

MEDIA ECOLOGY

Kevin Schut

We can only imagine the kind of cryptic observations Marshall McLuhan might have made about video games if he'd lived a little longer. The man was indeed a provocateur, poking at one of the major features of the modern era: the increasing importance of machines for human communication. His pithy statements and enigmatic ideas are impossible to prove, but as tools to spark intellectual curiosity, they work very well (Carey, 1998).

In the trippy 1960s, McLuhan's thoughts made him a kind of academic pop star—in both the positive and pejorative senses. However, he was not actually the lone figurehead of an isolated line of thought. He himself claimed (McLuhan, 1962) to draw inspiration from the Canadian economic historian Harold Innis (1950/1972, 1951). Important writings of Lewis Mumford (1934) and Edward T. Hall (1956/1990) preceded most of McLuhan's work and had similar themes. And around the same time McLuhan published *Understanding Media* in 1964, Eric Havelock's *Preface to Plato* (1963/1967), and Jack Goody and Ian Watt's article "The Consequences of Literacy" (1968) demonstrated similar concerns about the cultural impact of communication technologies. Numerous other scholars have further developed the ideas of this body of scholarship over the past few decades, including McLuhan's students Walter Ong, who wrote about the cultural transition in the West from orality to literacy (1967, 1982), and Neil Postman, the witty and articulate critic of modern media and technology (1985; 1993); McLuhan's colleagues at University of Toronto, such as anthropologist Edmund Carpenter (1960) and physicist and linguistic scholar Robert K. Logan (2000); as well a variety of others who have drawn on his work such as print historian Elizabeth Eisenstein (1979), media scholar Joshua Meyrowitz (1985), and digital culture critic Douglas Rushkoff (2010).

While these works form a diverse body of scholarship, running through all this media ecology theory is a concern with how technology has a shaping role in our communication and culture. The main argument is that the media we use are particularly good for certain communicative practices and not so good for others—they have a *bias*, as Innis put it (1951). Because of that bias, a print culture is likely to be different from a video game culture.

Anyone reading any amount of cultural criticism or sociology knows that this is a controversial argument, to put it mildly. Most scholars in the Cultural Studies tradition sniff at McLuhan as a crass technological determinist. Media ecology, goes the critique, ignores the flexibility of culture, the agency of viewers and players, social power structures, and struggles, ignores the socially-constructed nature of technology, and ignores the tremendous importance of the context of the functioning of technology. So is it even possible for media ecology to contribute anything to game studies?

This perspective is relevant to contemporary game scholarship, albeit with some careful caveats. The criticisms of media ecology are often well-founded and require a careful interrogation of what we mean by key terms such as “medium,” “communication,” and “technology.” Nevertheless, technologies are not culturally neutral—they are not blank slates upon which we can write any agenda or expression with equal ease, and communication technologies have a special importance to our culture. We need to go beyond technological determinism in order to revisit media ecology. In this essay, then, I will work through some of the relevant objections to media ecology and suggest ways in which we can better understand this perspective, ending with a brief sample of a media ecology analysis of the video game medium.

The Basic Concept of Media Ecology

Ong’s *Orality and Literacy* (1982) carefully builds the case that the arrival of the written word is a cultural watershed: once people become truly literate, everything changes. Ong notes, for instance, that oral cultures foster tremendous memory skills, as that is the only way to preserve knowledge; he backs this up with (among other evidence) Albert Lord’s research of Yugoslavian oral poets, who were able to recite enormous epics with little change from performance to performance. Eisenstein (1979) makes similar claims about the cultural impact of the printing press, noting, for example, that print popularized the modern, industrial notion of the standard; manuscripts are all individual handcrafted items, but a printed book has the exact same content on the exact same pages regardless of which copy we might look at.

This is media ecology in a nutshell. Every communication device we use, whether it is electric like radio, whether it is physically mechanical like a phonograph, or whether it is an immaterial technology like language, has built-in affordances and limitations. My iPod is very good for playing *SpellTower* (Zach Gage, 2011), but it is less useful for a big-screen display of an epic movie. These inclinations, however, have cultural implications; once a culture really becomes literate, there is far less need to memorize information.

The observations, however, stretch beyond a single medium. Although the technological basis of radio in the US did not change significantly between 1945 and 1955, the introduction of national television networks significantly transformed the older medium. Any proper media ecology analysis of communication technology looks at the entire media environment in which a given medium operates (McLuhan & McLuhan, 1988; Mumford, 1966; Postman, 1993).

The Critiques

Even the most carefully researched pieces of media ecology scholarship, however, are sometimes panned for being technologically determinist. Typically, critics worry about political implications of such a move. Like a *Transformers* movie, technological determinism reduces humans to bit players in a drama about machines. If humans have so little agency, why would we bother to try to change things for the better? To a critic of technological determinism, both pessimistic media ecologists such as Jacques Ellul (1964) and mass media cheerleaders such as the pop icon version of McLuhan (1964) play into a narrative that reinscribes and naturalizes the cultural hegemony of the class-based interests of the captains of digital industries and the representatives of Progress (Williams, [1974] 1992).

Political issues aside, there are good reasons to question the *accuracy* of technologically determinist accounts (see, for example, Finnegan, 1988). Humans have a funny tendency to do just what we don't expect with a given item (e.g. Hall, 1999; Fiske, 1987). If the same tool can be used in very different and unexpected ways, does that not demonstrate that something other than the technology is responsible for this or that feature of culture (Bijker, 1995)? Certainly the relatively brief history of video games seems to prove the tremendous flexibility of digital media: the same computer that can run an emulation of the Atari 2600 version of *Pitfall!* (Activision, 1982) can also allow us to play the classic text adventure *Hitchhiker's Guide to the Galaxy* (Infocom, 1984), the real-time strategy game *Starcraft II* (Blizzard, 2010), and the MMO (massively multiplayer online game) *Star Wars: The Old Republic* (Bioware, 2011). And this doesn't begin to tap into the tremendous variety of play-styles and cultures built around these games. How can we look at such a diverse body of work and their uses and identify what the technology is responsible for?

In a somewhat similar vein of critique, some scholars believe that when researching a transmedial phenomenon such as video games, it doesn't make much sense to pay attention to the technological platforms at all (Aarseth, 2004). We can play the exact same version of *Pac-Man* (Midway, 1980) on many different kinds of digital devices. Surely it is the *form* that ties these different cybertexts together, rather than the technology? Does it make much sense to talk about a video game medium, let alone *the* video game medium, as Mark Wolf does (2001)?

Even scholars who think the materiality of our communication technology is important will argue that media ecology can easily veer into overgeneralizations. Lisa Gitelman (2008) argues that any analysis of the impact of a technology *must* look at specific contexts—generalizing from a few specific cases will almost certainly lead to mistaken predictions and analysis in a different situation. The technology of the NES had the impact it did because of the experience of Atari, the Great Crash of 1983, and the relationship between Japanese and American cultures, to name a few factors; none of these will ever be exactly replicated again.

(Re?)Defining Media Ecology

These critical arguments are all legitimate concerns, but they don't invalidate the media ecology perspective—they simply force us to clarify and recognize some limitations. For example, Gitelman's concern about specificity is a good one, but it replays the eternal debate in the social sciences and humanities about the worth of making general observations about *anything* to do with culture. The fact is that in some senses, *every* geographic location, social group, and moment in history is unique. Yet, there are also forces, symbols, and structures that carry over from one situation to the next: if not, we would be caught in a kind of historical solipsism, in which each context would have meaning only for itself.

Postman (1985), for instance, argued that television turned everything into entertainment. As an absolute statement, this was and is an overgeneralization: the small screen can be sober, boring, and intelligent, as Postman himself noted. Yet he *was* on to something: broadcast video does not have limitless expressive capabilities, and it is certainly easier for it to do some tasks than others. Television as a technology certainly *is* well suited to the kind of personality-driven, hyper-motion gameshow/MTV style Postman feared was taking over other parts of life—better suited to do this than, say, print. That televisual facility for flashy moving images and character-oriented communication carries over to other contexts, whether it is used or not.

The key is not to talk about the cultural impact of media as if we were identifying absolute rules that will produce guaranteed results, but instead to talk about *tendencies*. This is why the concept of media *bias* is useful. A bias is not impossible to overcome—rather, it's an inclination.

Part of the reason media bias is a tendency rather than a rule has to do with the socially-constructed nature of technology. The fact is that media ecology does not require a simplistic understanding of communication tools. It is quite clear that technology has significant malleability, which is unsurprising, given that people make it and use it. I *can*, in fact, use my iPod to watch a movie meant for the big screen, and I can use an Xbox game controller for a nongame application. The purposes and use of any given technology is defined by the groups of people that are most concerned with it, as Wiebe Bijker (1995) points out in his in-depth history *Of Bicycles, Bakelites and Bulbs*.

Yet these same theorists note that technologies are not entirely flexible in their meaning and function. For one thing, technologies have a material reality that can't be wished away. Even supposedly immaterial technologies such as software code reside on physical disks and move through physical wires—Mia Consalvo's (2008) analysis of lag in online games is a good example of how that physical reality matters. For another, even beyond the physical reality of a device or strategy, there comes a point where the social understanding of a technology stabilizes and loses (in Bijker's terms) its "interpretative flexibility." Once the handheld console is a well-understood and widely accepted concept, it is hard to do something very different with it. Not *impossible*—as the Nintendo DS's two screens illustrates—but difficult. In other words, while technologies are very much the creation of people, they are not completely fluid. They have built-in and culturally constructed limitations and abilities that can be difficult to ignore.

Given all this, in the Actor–Network Theory he has developed, Latour (2005) argues that sociology of technology should accord machines the status of actors. That is, devices are non-human social forces: the physical technologies themselves impact social structures and interaction, albeit in a different manner than humans.

But can we even talk about a "video game medium" as a singular thing? Should we lump together games *and* game machines, forms and machines? I like Gitelman's take:

> I define media as socially realized structures of communication, where structure include both technological forms and their associated protocols, and where communication is a cultural practice, a ritualized collocation of different people on the same mental map, sharing or engaged with popular ontologies of representation.
>
> (2008, p. 7)

A medium is not an inert machine all by itself—without a familiarity with moving-image conventions and without the system of broadcast and the bureaucracies that make that possible, television would not really communicate.

That still leaves a lot of room for discretion: we could talk about the computer as a medium, or we could define a particular kind of computerized communication, such as video games, as a medium. I think these are all potentially useful, but for my part, when I'm talking about the video game medium, following Gitelman's definition, I would include the devices used to play video games (recognizing that many, if not most of these devices, such as PCs, are often more than video game machines), the institutions, organizations, and delivery systems necessary to make those games available and working, and the culturally constructed understandings of the video game form. For *Pac-Man* or *Fallout: New Vegas* (Obsidian Entertainment, 2010) to be meaningful, we need a machine, enabling systems for that machine, and a tradition of understanding. Of course, we could study each of these three elements in isolation. The medium, however, as the "socially realized structure of communication," is where all three of these elements come together.

In short, media ecology argues that the media we use form a kind of communicative landscape, setting, or environment within which our communication occurs. That environment is composed of physical and non-physical technologies, technologies that have non-human components, yet are still socially created and maintained; the environment can change and *does* change. Finally, our media landscape does not strictly *determine* our activities. To use the metaphor of the physical environment, there are an awful lot of different things you can do on an open hillside, but it does *influence* the way things move. It takes less effort to go down a hill than up it, just as it's easier to use a game controller to play a game than to control the playback of a DVD.

A Brief Consideration of the Media Ecology of the Video Game

Because the video game medium is so complex and constantly shifting, it is hazardous, as Gitelman and others note, to generalize about it. But video games do have certain key features that hold true across different contexts. For instance, they are all computerized (or, in a few of the earliest video games, used transistors for a similar kind of electronic logic), screen-based, and require active user participation. In my own work, I have continued to run across three key characteristics of video games: playable systems, automation, and transmedial emulation.

As many game studies scholars have noted, all games are playable systems of rules (see, for example Salen & Zimmerman, 2004; Juul, 2005). They are *more* than this, but they are not less. We can represent games as a series of if-then statements (if I press "A," then I shoot), even if the social interactions of players, the attached and integrated narratives, and the cultural meanings invoked by the game are usually not so neat and tidy. Whether the player notes it or not, the game cannot do without the if-then series of events. This systematic characteristic of the game form is then further reinforced in the video game medium by the procedurality of computers (Bogost, 2007). All elements of a video game that a player actually uses or accesses must be functional code, or the game is likely unplayable or unwatchable.

On top of this, all video games employ extensive automation (Manovich, 2001). All machines augment human capacity, but computers allow for an unprecedented flexibility of human enhancements, and they allow for the automation of communication and other cultural activity. On a low level, computers can remove the need to physically process aspects of board games: playing the complicated board game *Le Havre* (Codito Development, 2012) on an iOS device eliminates the need to count and set up all the little pieces. But automation in video games can mimic human interaction—like the AI behaviors in *Fallout: New Vegas* that respond to simple stimuli such as aggressive behavior, territorial violation, or social reputation. And in complicated simulations, this mimicry can approach something like the behavior of actual humans and can produce unanticipated and unique cultural interactions, as evidenced by all the bugs and exploits gamers discover. Nonetheless, game automation is never fully human, and to this point usually doesn't fool gamers (*à la* the Turing Test). In any case, whether it's complex of not, all video games employ *some* automation.

The upshot of all this is the medium has a bias toward a kind of mechanization of culture. A video game *may* be full of free-flowing decoration, but it *must* have fully-defined elements that act according to a precisely-defined set of rules. Even if the very purpose of the game is some kind of creative activity, such as *Draw Something* (OMGPOP, 2012), the creation happens within the bounds of game rules and code. And even the most complex automation is, at base, a cultural phenomenon of coded cause-and-effect. It's very true that machine–human interaction produces remarkable art and unpredictable culture, but computers still cannot act in the same way as humans.

Complicating this bias is the ability of video games to remediate other media. Computers can, of course, do audio, still and moving images, text, and haptic feedback (primitive as today's vibrating controllers still are). Thus, all the communicative possibilities of previous media are part of the game maker's toolbox. Video games can be movies, radio, books, theatre, and more. However, remediations are not the same thing as the original, even when they are apparently identical (Bolter & Grusin, 1999). An audio broadcast on a computer is not identical to the gramophone analog recording of the same sound, even if they both play the same hisses and crackles. And some media, such as books, must be modified substantially; a pageless manuscript on a non-retina class display cannot be the same as a real tome.

I would argue that this emulative capacity of video games allows for a great flexibility in communication, and clearly complicates the systematic bias of the medium. Cut-scenes with high production values, such as those produced by Blizzard in many of its games, demonstrate that video games can do what movies do. Text-based adventure games and other interactive fiction employ many of the same tools as novels. Social games are frequently tightly integrated with Facebook. Yet in every case, these emulations put imitations of different media in a new context, and they can't entirely eliminate the mechanistic bias of video games.

A brief analysis like this is, in the end, a "probe," in the McLuhanist sense—an exploration that requests a deeper engagement of today's media environment. Clearly there is much more to be said about video games, and any media ecologist that tries to reduce the study of video games to a consideration of nothing more than technology is overreaching. But as part of the diverse intellectual toolbox available to game studies theorists, media ecology is a worthwhile perspective to engage.

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41
RESEARCH
David Myers

History

Video games were developed in principle in the late 1940s, but it wasn't until the 1970s that Nolan Bushnell and Atari made video games commercially successful within a mass marketplace. As a consequence, during the 1970s, a variety of consumer magazines, dedicated to particular video gaming console platforms (and serving as advertising for those platforms), published rudimentary descriptive analyses of video games as game reviews and play guides. Over the next decade, more detailed and rigorous analyses of video games and play were relatively rare and more often intended for—and governed by the demands of—popular than academic concerns (e.g., Sudnow, 1983).

Combined references to "video/computer/digital games" within scholarly databases from 1980 to 2010 show this initial flurry of video game research as a brief (and relatively shallow) peak in 1984, followed by a sustained period of references into the 1990s, when all such references increased dramatically and exponentially. Virtually all topics specific to video game research can traced to this initial period of interest in 1980s.

Research appearing in scholarly publications dating from the 1980s include some of the first literature reviews of the scholarly study of video games (Greenfield, 1984; Price, 1985), initial reflections on the effectiveness of video games as learning tools (Malone, 1980; Harris & Williams, 1985), one of the first doctoral theses addressing video games as "interactive fiction" (Buckles, 1985), and the beginning of the empirical study of the psychological and physiological effects of video games, particularly violent video games (Dominick, 1984; Graybill, 1985; Cooper & Mackie, 1986).

After the video game industry had weathered the economic difficulties of the mid-1980s, the next sustained surge of video game research—again, in concert with the introduction of new video game technologies and, particularly, Internet-based technologies—occurred alongside the industry's transition from designing single-player games for in-home personal computers to designing multiplayer and social games for web-based environments. This increased emphasis on social games and social activities is marked by Blizzard's release of *World of Warcraft* (2004).

Video game research remains today largely focused on market-driven designs distributed and played with the aid of social media and over social networks, including games designed for dedicated video game consoles such as Sony's PlayStation (1994) and Microsoft's Xbox (2001), each now associated with its own video game marketing, sales, and distribution online network.

Influences

Prior to examining more contemporary contexts for video game research, it is useful to note foundational works published prior to the rise of the video game industry that find frequent reference: Huizinga's *Homo Ludens: The Play Element in Culture* [1938] (1955) and Roger Caillois's *Man, Play, and Games* (1961; 1958, in French).

Huizinga, a Dutch historian, emphasized an understanding of play as necessary to an understanding of culture—still a critical assumption in much video game research—and introduced, though rather obliquely, the notion that games are isolated within a "magic circle" of play. The Huizinga text remains a source of inspiration and guidance within the youngish field of game studies by providing an authoritative link to more established research traditions; however, Huizinga's work also has been in tension with dominant video game research in positioning play prior to (and thus somewhat apart from) cultural influence. This tension serves to indicate how firmly cultural studies and relativist assumptions pervade contemporary video game research.

Man, Play, and Games, as its English title indicates, explicitly focuses on games and therein more directly establishes its relevance and application to the study of video games. However, Caillois posits generic (and seemingly universal) categories of games, and this is an issue of contention within contemporary video game research insofar as these categories are understood to be intrinsic to game form rather than references to player choices made within social contexts of play.

In addition to these two commonly cited foundational works, many other recurring influences on video game research have originated—and largely remain—on the peripheries of game studies proper. These remain relevant to video game research insofar as they, like *Homo Ludens*, emphasize human play as a cross-cultural and crosstemporal phenomenon. Representative examples include Sutton-Smith's *Ambiguities of Play* (1997) and Csikszentmihalyi's *Flow: The Psychology of Optimal Experience* (1990)—offering, respectively, sociological/cultural and psychological analyses of human play phenomena. Other theorists and theories explicating play in specific functional contexts—e.g., Piaget (1962), as regards cognition/education; Spariosu (1982), as regards communication/literature, and Fagen (1981), as regards evolution/animal play—also serve as predecessors to contemporary video game research.

Gaps

It is also interesting to note those studies and approaches that, despite direct reference to games, have been relatively ignored by video game research. These include the significant body of research associated with "game theory" in economics.

Game theory, in essence, attempts to optimize game play for all participants without regard to aesthetic or cultural consequence and therein provide a mathematical analysis of human decision-making. While game theory has developed terms and concepts applied in video game research (e.g., "zero-sum games" and "min–max solutions") optimizing video game play in the abstract has not proven a consensually high priority for video game research, which commonly considers "optimization" of play significantly affected by commercial and cultural concerns.

For similar reasons, the ontological status of games has been of only passing and isolated concern within market-based video game research. There was, for instance, prior to the 1980s period that saw the first sustained scholarly publication of video game research, extended discussion in philosophy journals and proceedings (Kolnai, 1966; Suits, 1969) as to whether games are essentially paradoxical. This discussion proved substantiative to subsequent publications (Suits, 1978; Suber, 1982, 1990); however, this sort of formal analysis has not gained lasting traction in game studies.

Current Trends

Video game research is most often published in those journals that have newly risen to accomplish the task (e.g., *Games Studies* (online) 2001; *Games and Culture*, 2006; *Eludamos* 2007), but also in more long-lived journals specializing in games, play, and related topics, particularly as these are relevant to educational goals (e.g., *Simulation & Gaming* (originally *Simulation & Games*, 1970), *Digital Creativity* (originally *Interactive Tutoring Media*, 1990)). There is also a widely-attended and influential body of video game analysis published online and in industry-related venues such as *Gamasutra*—a trend affecting scholarly publication in general and one particularly relevant to video game research.

Given the explosion of video game research and the tenuous state of traditional academic publications, it may be less useful to categorize contemporary video game research by specific example than by recurring theme. And even this may be problematic in its representation of a currently eclectic field as one with clearly defined and exclusionary themes. Nevertheless, there are dominant video game research themes and topics worthy of acknowledging insofar as they seem to accompany and, in many instances, align with the economic growth of the video game industry.

Video game research can be understood by its focus on the video game itself, video game player(s), and/or the context in which video game play takes place—most particularly the *cultural* context.

Video Games

Edmond Hoyle’s sixteenth-century publications describing the rules of card games, along with related analysis of how best to play those games, are early examples of game-centric scholarship of the sort that is seldom acknowledged as such in contemporary video game research. The closest contemporary analog to Hoyle’s publications are the “how-to” guides accompanying the release of complex video games—often designated as game “supplements.” These printed guides, online walkthroughs, and other explications of video game play are then less commonly considered scholarship than are explications of video games as objects of mass production and consumption.

Scholars producing game-centric scholarship include theorists-practitioners who attempt to conceptualize video games in order to make games easier both to understand and to build. Chris Crawford (1982) was one of the earlier theorists-practitioners of this sort, but has since been succeeded by others working in a similar tradition and according to similar (broadly conceived) assumptions and goals (e.g., Mateas, 2001; Koster, 2005; Bogost, 2008).

Video game research of this game-centric sort normally considers one or more video game elements as critical to the function of games, or, alternatively, to the identity and unique function of *video* games. As video games are inextricably linked to digital media, this branch of video game research might also include media theorists (e.g., Kittler, 1999; Manovich, 2001), even in cases where there is no explicit concern with or reference to games.

Because of the interactive nature of video games, traditional content analysis is not comfortably adapted to game content. Nevertheless, in many cases, video game research continues to borrow and adapt methodologies and approaches from text-oriented analyses in other fields (e.g., semiotics (Myers, 2003), literature (Aarseth, 1997; Ryan, 2006), and film (Grodal, 2000)) in an attempt to isolate particular game structures and procedures (e.g., of logic and narrative) indicative of particular structures and procedures of human cognition. This emphasis on game play as a cognitive process then overlaps with research focused on video game players.

Video Game Players

Research on video game players is dominated by motivational analysis and effects-based studies, often using methodologies and assumptions from earlier and related mass media research on film and television audiences. However, due to the proprietary nature of video game play in mass market contexts (e.g., within MMOGs (massively multiplayer online games) such as *World of Warcraft*), research involving mass audiences/players often requires some level of cooperation and coordination with commercial game companies. This has been the case, for instance, with large-scale studies of online video game player behavior, particularly insofar as those studies correlate conventional audience demographics with game player behavior (e.g., Williams, Consalvo, Caplan, & Yee, 2009).

This category of video game research has incorporated the study of both positive (prosocial) and negative (antisocial) effects of video games, and has produced a large body of research devoted to adapting video games for educational use (Wilson et al., 2009) and, simultaneously, justifying that use (Randel, Morris, Wetzel, & Whitehill, 1992; Funk & Buchman, 1995; Gee, 2004). Both prosocial and antisocial effects studies can be quite specific in examining video game effects on players of a particular age or regarding a specific task, but effects-based research can also include consideration of long-term and, upon occasion, speculative effects of video game play (e.g., the use of video games as tools for ethical consideration and reflection (Sicart, 2009)).

Anderson (2004) and his colleagues (Anderson & Bushman, 2001; Carnagey & Anderson, 2004; Barlett, Anderson, & Swing, 2009) have published prolifically on the effects of violence in video games (Emes, 1997), producing exhaustive reviews of empirical research on this topic—most recently Anderson et al. (2010). By and large, these studies have found negative effects of violence in video games, but these findings have been disputed by empiricists (Bensley & van Eenwyk, 2001; Ferguson, 2007) and by those using more qualitative methods of observing and interpreting video game play (Jones, 2002; DeVane & Squire, 2012). These latter studies characteristically engage video game play and players directly, often as active members of video game player communities and/or as video game designers and consultants.

Video Game Contexts

The third and broadest category of video game research focuses on the context of video game play. This includes (what are generically known as) “cultural” studies (Shaw, 2010; see also Williams, 2005), as well as research focusing more specifically on one or more critical contextual variables. Because this research takes a contextual view of video game play, that play is often subsumed within a larger set of activities within “virtual worlds.”

Fine (1983) is an early and influential use of ethnographic methods to study gaming contexts. Taylor (2006), Nardi (2010), and many others have since used similar methods to describe online communities composed of video game players. And similar anthropological accounts of behavior closely associated with video game player communities can be found in Malaby (2009) and Boellstorff (2008).

Consideration of the legal implications of video games began very early in the history of video game research (Hemnes, 1982; Dobb, 1983). More recently, Lastowka (2010) and others have examined video game play—again, broadly defined to include virtual world activities—as to whether traditional and conventional legal concepts of ownership, copyright, and privacy can be usefully applied to digital objects in new media contexts.

Castronova (2005) has examined virtual world economies with the assumption that those economies operate similarly to real world economies. And, indeed, the current and pervasive economics of MMOGs—resulting from both the popularity and the profitability of these games—have proven fertile ground for video game research of all sorts. To isolate but a single example, “gold farming” in MMOGs has been examined to determine objective characteristics of cheating (Ahmad et al., 2009), as an indication of player choice and self-determination (Steinkuehler, 2006), and as a cyborgish synthesis of player and machine, work and play (Dibbell, 2006).

Ultimately, research in this category positions video games alongside other consumer products in a capitalist market economy and determines the value (positive or negative) of video games according to how those contribute to the sustenance of that economy. Dyer-Witheford and de Peuter (2009) and Apperley (2010) adopt a macro-sociological perspective of this sort, whereas work by others with similar contextual assumptions may be more social-psychological, e.g., considering how video games and related play affect individual consumer behavior by promoting a “hedonist” virtual consumption (Denegri-Knott & Molesworth, 2010).

Summary

These three categories of contemporary video game research offer only a rough approximation of the variety of video game research currently published. (For other thematic categories, see Corliss, 2011, and Kline, Dyer-Witheford, & de Peuter, 2003.) Game studies remains an eclectic field, complicated by the degree to which video game consumer and marketing interests affect video game research funding and game studies programs, courses, and curricula.

Nevertheless, there is now a critical mass of video game scholarship that, since its inception during the 1980s and its proliferation during the 1990s, has produced a number of overviews, summaries, and compilations. These include introductory game studies texts (Mayra, 2008;

Nielsen, Smith, & Tosca, 2008), readers (Wolf & Perron, 2003; Raessens & Goldstein, 2005), and literature reviews that serve, in bulk, to distinguish the study of video games from the study of thematically similar topics (e.g., film and literature), digital media more generally (Wartella, O'Keefe, & Scantlin, 2000; Wartella, Lee, & Caplovitz, 2002), and the networked society within which video games are now embedded.

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42

RETROGAMING

Michael Thomasson

In the modern age, most people play games on contemporary consoles such as Microsoft's Xbox 360 (2005) or Sony's PlayStation 3 (2006). Portable smart phones, tablet computers, and mobile music players, such as Apple's iPod or Microsoft's Zune, have also emerged as viable gaming platforms. New games are constantly being added to the platform libraries and are sold in multiple retail outlets, thus making them readily available. Retrogaming, also commonly referred to as old-school gaming, pertains to the use of retired hardware that is no longer being produced and no longer receives software support from the original manufacturer for gaming. Retro games encompass games initially played on vintage home gaming consoles, personal computers, or even coin-operated arcade games. Fortunately, the fun did not end when the original hardware and software manufacturers closed shop or moved on. While many old consoles and games have been relegated to a box in the basement or attic, a great deal are still actively being used and the trend seems to be growing. In fact, using the original hardware is no longer even necessary in some cases, as time and technology have created other means of resurrecting games long since forgotten.

Modern consoles can play retro games from physical media such as a CD-ROM, through officially published video game compilations. Namco, Midway, Taito, Data East, SNK, SEGA, and others have ported classic arcade and console games for use on today's dominant hardware. Examples are *Midway's Greatest Arcade Hits* (2001), *Taito Legends* (2005), *Sonic's Ultimate Genesis Collection* (2009), *Data East Arcade Classics* (2010), and the popular *Namco Museum* series (1995–2010) that has been ported to over a dozen platforms. Modern consoles, such as the Nintendo Wii, allow old-school games to be enjoyed via its Wii Shop Channel, and classics such as *Donkey Kong* (1981) and *Super Mario Bros*. (1985) can be played via their Virtual Console service. In fact, games from several competing platforms of the past are present, such as the Commodore 64 (1982), the SEGA Master System (1985), SEGA Genesis (1988), the Super Nintendo Entertainment System (1990), and SNK's Neo•Geo (1990) to name a few. Microsoft offers a similar service and access to dozens of classic games through its Xbox Live service, as does Sony with its PSN Network.

Plug & Play TV Games, such as those made by Jakks Pacific, offer simple solutions to play multiple classic games on a modern television. By simply popping a few batteries into a single controller and plugging the device into a standard television's audio and video jacks, one can be playing games from the past in minutes. AtGames and other companies including Atari themselves have released newly designed hardware that houses dozens of games such as the Atari Flashback consoles (2004, 2005, 2011) that feature actual games from the 1970s and 1980s running on a system released in the twenty-first century. Tommo Inc., in partnership with SNK Playmore, released the Neo•Geo X Gold Entertainment System (2012) which houses 20 classic Neo•Geo arcade titles within a replica SNK console. The unique design also separates in parts to form a handheld portable device.

Similar to the Plug & Play units, there are also non-dedicated retro systems that play actual cartridge games from their original era. For example, Hyperkin has released several modern systems that play vintage cartridges such as the FC Mobile II (2009) that plays NES games, and its popular Retron 3 system (2011) that will play most games originally designed for play on the Nintendo Entertainment System, the Super Nintendo Entertainment System, and the SEGA Genesis, all with a single unit. Other competitors include the FC Twin (2006) and Retro Duo (2008) by Retro-Bit, and Tomee's NES & Genesis Dual Action 2-in-1 Retro Video Game System (2010).

Another means of playing retro games is through software emulation. An alternate device, through the use of software, can allow another completely different and unrelated platform to operate its gaming software. There are dozens of emulators for most vintage gaming hardware available for the personal computer and other devices. For example, the Multiple Arcade Machine Emulator (1997), also known as MAME (http://mamedev.org/), is a popular arcade coin-op emulator that first was designed for the computer, but has now been ported to countless other platforms from modern game consoles to cell phones and mind-bogglingly, even to the Kodak DC-260 digital camera.

Many retro gamers like to simulate the actual controls set-up when playing classic games through emulation. Several companies, such as HanaHo and SlikStik, make custom controls for use with MAME that are designed with genuine Happs arcade joystick and buttons that look and feel like an actual coin-op control panel. Various models are available, some including custom controls such as a trackball and/or spinner. X-Arcade even manufactures and sells full-size arcade cabinets for home use.

There are also controller solutions for those emulating classic console games in their home on their personal computer. While vintage game system software can be emulated quite well, playing a classic NES game with a computer keyboard or standard computer controller is not the same as playing with a genuine NES controller. Fortunately, companies such as RetroLink offer replica joysticks with USB ports to make the simulation more authentic. Likewise, RetroZone makes adapters that allow an actual controller to interface with a computer via a USB connection.

Other new games are created in the fashion of older titles to simulate a retro feel. These are sometimes referred to as retro remakes or be labeled as modern retro. By restricting screen resolution, color palette, audio capabilities, and other parameters, it is possible to create a game that looks substantially similar to a game developed on older less powerful hardware.

Some pioneering game companies such as Capcom have made modern-day sequels to retro franchises, for example, the *Mega Man* franchise. While the majority of the original *Mega Man* titles were released for vintage Nintendo brand hardware, *Mega Man 9* (Into Creates and Capcom, 2008) and *Mega Man 10* (Initi Creates and Capcom, 2010) were both released digitally for the modern Nintendo Wii platform, and even its rivals, the Xbox Live Arcade and the PlayStation Network. Despite being programmed specifically for high-end equipment, both versions resemble the classic games released for Nintendo's premiere gaming console, the NES.

R-Type Dimensions was released for the Xbox 360 in 2009, and was a compilation of the classic coin-operated shoot-'em-up games *R-Type* (Irem, 1987) and *R-Type II* (Irem, 1989). The game is unique and appeals to retro gamers because the graphic style can be switched with a single button press, alternating between the original classic graphics and a modern rendition of the games.

Galaga Legions (Namco Bandai Games, 2008), *Pac-Man: Championship Edition* (Namco Bandai Games, 2007), and the contemporary *Space Invader* titles are more modern in their appearance than their predecessors. However, by keeping the same gameplay style and continuing the use of a rather rudimentary controls system by today's standards, they all mimic the adored game titles from three decades ago.

Many new retro games do choose to use more horsepower than their predecessors but keep the feel of classic gaming intact by implementing an art style that mimics or gives a nod to the classics. Atlus's *3D Dot Game Heroes* (2009) and Mojang's *Minecraft* (2011) titles are definitely more sophisticated than games released decades before, due to their three-dimensional rendering, which was not possible at the time. However, the landscapes and characters within both games are designed with cubes that are a throwback to the early days in the industry when pixels were blocky. Some game franchises are resurrected from a retro game in the past and given a fresh paint job, so to speak. These games are known as "reboots." They differ from remakes as they play and appear completely different from their predecessor, whereas a *remake* keeps the initial game mostly intact.

While not retro games by definition, there are new games being created by video game fans and hobbyists made specifically for classic gaming consoles. As a result, homebrew games are often associated with retrogaming. Homebrew titles are new games created for classic game consoles (such as the original Atari consoles) that traditional software publishers have abandoned. The homebrew scene first came to light in 1993 when engineer Harry Dodgson created his own development kit for the Atari 7800 and later modified it for use with the Atari Video Computer System (VCS). Fast forward almost 20 years, and now hundreds of homebrew titles exist. The list of new retro releases continues to grow and can be obtained by contacting the original programmers or through small homebrew distributors such as Atari Age (http://AtariAge.com) and Good Deal Games' Homebrew Heaven (www.GoodDealGames.com).

To date, most homebrew releases are original in nature, or ports of games from another retro platform. However, some retro programmers are making what is referred to as "demakes." Demakes usually take a more modern title and port the game to an older platform. For example, the popular *Halo* series premiered on the original Xbox in 2001 and continues today on Microsoft's Xbox 360 console. However, in 2010, Ed Fries, Microsoft's former vice president of publishing, released a version of *Halo* for a console more than 30 years old—the Atari VCS also known as the Atari 2600 console. *Halo 2600* was released at the Classic Gaming Expo (CGE) 2010, an event that usually occurs in Las Vegas semi-annually. CGE features many vendors selling classic games and gaming paraphernalia and collectables. Events such as classic gaming trivia, world record high-score attempts, and other contests help celebrate the rich history of video games. Musical concerts feature bands playing music from vintage video games or chip-tune music, which is electronic music created with sound chips from retro video game consoles or arcade machines. One draw of the CGE is the opportunity to meet and collect autographs from the founding fathers of classic gaming. Guest speakers such as gaming pioneers Ralph Baer (the father of home video games), Nolan Bushnell (the founder of Atari), Al Alcorn (the creator of *PONG* (Atari, 1972)), David Crane (the programmer of *Pitfall!* (Activision, 1982) and co-founder of Activision, the first third-party publisher), Don Bluth (animator of *Dragon's Lair* (Cinematronics, 1983)), and other retrogaming celebrities have all made appearances at CGE.

There are other classic gaming events around the world as well. Domestically they include: Too Many Games, Oklahoma Gaming Exhibit, The Midwest Classic, Classic & Computer Gaming Show, Columbus Ohio Retro Gamers Society, The Video Game Summit Game Expo, Mid-Atlantic Game Festival, Southern California Classic Collectors SC3, and more. On the international classic gaming scene, they include the Replay Expo in Manchester, England; AdamCon in Quebec City, Canada, and the Vancouver Gaming Expo in New Westminster, British Columbia.

The resurrection of old platforms and the many classic gaming trade shows proves that, over time, retrogaming has become part of popular culture. Popular television shows such as *Seinfeld* (1989–1998) and *Family Guy* (1999–2002, 2005–present) make references to games such as *Pac-Man* (Namco, 1980) and *Frogger* (SEGA/Gremlin, 1981), games that are now more than three decades old. Disney themselves released a movie entitled *Wreck-It Ralph* (Rich Moore, 2012), which takes place in a vintage arcade named Litwak's Family Fun Center and Arcade. The film tells the story of a game villain who gets tired of playing the bad guy in the coin-op game *Fix-It Felix Jr*. for 30 years, and features cameos by classic video game characters such as *Q*bert* (Gottlieb, 1982) and Zangief of *Street Fighter II* (Capcom, 1991).

Similar to how movie stars, rock bands, and athletes create a fan base, many classic gamers pursue games created by a particular game designer such as Eugene Jarvis, Shigeru Miyamoto, Yu Suzuki, or Tim Schafer, to name a few. For instance, a retro gamer who enjoys the early 1980s games *Missile Command* (Atari, 1980) and *Tempest* (Atari, 1981) in the arcades may pursue other titles designed by their creator, Dave Theurer.

Video game development or game publishing companies may also encourage a following if they become known for quality software. Companies such as SEGA, Nintendo, Capcom, Konami, and Namco all have brand recognition that appeals positively to the retrogaming community. Controlling a popular intellectual property spurs sequels that encourage a player to continue playing a game in a series such as *Prince of Persia*, which has spawned over a dozen titles since 1989. Furthermore, the video game launched a full-length theatrical film (*Prince of Persia: The Sands of Time*, directed by Mike Newell in 2010), an action figure toy line by McFarlane Toys (2010), and other licensed products.

Historical groups have emerged to archive, preserve, and display all aspects of retro games. Videotopia is a travelling exhibition that displays portions of its 15,000 video game memorabilia pieces in numerous science museums such as Philadelphia's Franklin Institute. The International Center for the History of Electronic Games, part of Rochester's Strong Museum of Play, houses and displays well over 37,000 video game related artifacts. The University of Michigan's Computer and Video Game Archive (www.lib.umich.edu/computer-video-game-archive) has approximately 3,000 games and since it is a library, it allows the games to be checked out and played among a series of gaming stations within its walls. Digital Press, a popular website with classic gamers (www.digitpress.com/), is currently in the process of expanding its Classic Gaming Expo Museum into a full-fledged Video Game History Museum.

With retrogaming going mainstream, long-running black-and-white photocopied fanzines such as the one that Digital Press has been circulating for over 25 years, have encouraged new full-color magazines such as *Video Game Trader* to appear. In the United Kingdom, the more established *RetroGamer Magazine*, which recently celebrated its 100th issue (March 2012), continues to grow its subscription base. Furthermore, classic gaming content has expanded past the traditional print medium of its day and now appears heavily on the Internet. From countless websites to video streaming resources such as YouTube and even social media outlets such as Facebook, retrogaming is everywhere.

Many individuals who play retro games also collect them. The act of retrogaming begs the question, “Why is there interest in such old technology?” Of course, there are many reasons for playing and collecting classic video games. But first and foremost, it is simply a pastime. This is how most enter the hobby. There are, however, many factors as to why individuals continue with the endeavor.

The simplest explanation, which is often overlooked, is simply because one can. Retro video game hardware and software was very durable. Solid state electronics usually have no moving parts so they are more resistant to damage. A classic but sturdy Intellivision will survive longer than a modern console’s moveable parts, such as CD-ROM drives, motorized doors, and liquid coolant. Cartridge games from the early 1980s will certainly outlive their modern day CD-ROM, DVD-ROM, and Blu-ray counterparts, which can be easily scratched.

Many collectors play classic games for their simple mechanics. Gameplay is easy to learn, since many retro games require only basic joystick maneuvering and a button or two to press. Many modern gamers who have grown up with video games now use classic games to introduce their offspring to the hobby, often with the very same games that they themselves played at their age.

Flexibility of challenge offers much encouragement to players. Adjustable skill levels and hundreds of game playing options (for example, *Combat* (Atari, 1977)), allow the user to customize his or her playing experience. Virtually anyone of any age can participate in the hobby of retrogaming. Many players and collectors enjoy classic games for the technical merit. Due to technological restraints of the time, early game designers could not depend on tools such as full-motion video, expanded color palettes, transparency, rotation, zooming effects, complex lighting, physics engines, or even threedimensional graphics to distract the player. As a result, classic games concentrate on solid gameplay.

An advantage to collecting games is the necessity of few resources, particularly the minimal expenditure needed to start the hobby. While it’s true that obtaining some rare games can require some hefty trading or cash resources, overall there is great fun to be found rather inexpensively. Many classic games are now available for fractions of their original consumer retail price. Atari, Intellivision, and many other games are easily found for a mere dollar each. The games that have risen in value over the years are usually the titles that originally were not in demand. Their lack of popularity and inferior sales resulted in low production runs. This means, in most cases, that the games that are most enjoyable to play are the least expensive to purchase. Collecting console games allows for various levels of interaction. Baseball cards show an image of the player and a few statistics to read and learn about and comic books tell a story and the artwork within may be aesthetically pleasing to the eye, but few hobbies allow for such interaction as do video games. A single video game can be played for hours, and role-playing games for months, with little or no duplication of events. Even classic games, with few boards and levels, are never the same game twice. The challenge of collecting is also alluring. Trying to locate all the Atari 2600 cartridge variations is a quest that could last a lifetime, while a Magnavox Odyssey collection could be obtained in a single summer. Oh, the thrill of the hunt! Of course, since we are dealing with "classic" games, there is the admirable factor of antiquity. Aside from being collectables in themselves, there is a lot to be said for nostalgia. For many of us, retrogaming is a part of our past. With the entertainment form covering decades, many of us simply remember fond times with our family and friends in the safety of our living rooms. We know that beside each of those identical boxes, with its wires running into the back of our television set glowing blue in the sinking twilight, that there were people with stories.

43

VIOLENCE

Peter Krapp

Humans have always had violent games, from individual competitions such as wrestling or boxing to spectacles such as gladiatorial combat or rugby; these might variably be seen as appealing to instinct, as expressions of frustration in civilization, or as necessary and playful steps in social learning. Human culture has also long included representations of violence in the arts, whether on the theater stage or the painter's canvas, in literature or in cinema. So what is it that puts video games in particular into the crosshairs of criticism? Is it merely that conflict is never boring—and games are at a basic level about avoiding boredom? Or is it is the medium specificity that sets gaming apart? Certainly interactive immersion poses a different set of issues than representations of violence on stage or on a TV screen. Arguably, it is easy to see why there is a good deal of violence in video games: exciting interaction beats boredom, and adolescents in particular, who feel little control over their lives or power in society, may gravitate to transgressive thrills of fighting, shooting, and war. Here it is less a question of game genre than of what kind of violence the in-game actions afford the player. While few people would object to the quaint two-player interactions of jumping, crouching, feinting, and punching in games such as *Karate Champ* (Technos, 1984), *Street Fighter* (Capcom, 1987), or *Tekken* (Namco, 1994), some critics question the morals of more recent fighting games such as the *Mortal Kombat* series (Midway, 1992–2009) that allow the victorious avatar to murder their defeated opponents with special moves. Similarly, critics of other game genres tend to object not to the portrayal of horror, war, or gun fights in general, but specifically to graphic features such as the slow-motion impact animations of *Sniper Elite* (Rebellion/MC2, 2005) that appear to glorify violence. The salient question is therefore whether there might be harmful (side-) effects of violent gaming. In retrospect, the public debate about the difference between the film *Death Race 2000* (Roger Corman, 1975) and the arcade game based on it, *Death Race* (Exidy, 1976) may seem quaint, but it is worth noting that while the film's deliberate excess was controversial because its dystopian social satire questioned culturally-sanctioned and institutionalized modes of cinematic violence (military, police, frontier justice), the game reduces the plot to a car race to mow down pedestrians, and so, despite its crude stick figure graphics, it was perceived as more provocative than the film (Kocurek, 2012). As negative as the media coverage of the game was, it clearly drove sales of the game, and this has remained true of infamous games since then.

Undoubtedly, games have become more realistic and immersive over time. The commercial success of another violent car game, the *Grand Theft Auto* franchise (Rockstar Games, 1997–onwards), also came with a lot of worry among critics, politicians, and the press about the alleged effect of its violent content, to a degree that never accompanied the famous *Godfather* movies or the small-screen prowess of the *Sopranos*—the 2009 *Guinness Book of World Records* named *Grand Theft Auto* the most controversial video game series in history. Some of the affordances of gaming seem to corroborate that the crux of the matter is medium-specificity, such as the subjective angles and interactions typical of horror, fighting, and shooting games, often with a spatial construction that makes the aim of one's control device on screen and the vanishing point coincide.

Take a look at the first-person shooter (FPS), which would eventually give rise to some of the most realistic depictions of violence and to some of the most immersive three-dimensional engagement with screen violence. Games such as *Maze War* (Steve Colley, 1974), *Spasim* (Jim Bowery, 1974), and *3D Monster Maze* (J. K. Greye Software, 1981) gave rise to a wave of later 3D FPS games. Long before the 3D representation of computer space fully took off, *Catacomb 3D* gave id Software its start in the FPS genre in 1991, and they used the same technology in *Wolfenstein 3D* (1992) with more color and a richer range of motions. The following year, 1993, saw the publication of *DOOM* (by the same publisher), still one of the most often mentioned titles when people discuss violence in games, along with *Duke Nukem 3D* (Apogee, 1996). What these canonical games have in common is that typically their screens show a weapon controlled by the player and aimed at the vanishing point in the center of the screen. This merging of the field of vision with point and shoot controls (at the expense of peripheral vision and spatial detail) marks the FPS game and encourages the interpolation of the player. What you see on the screen is what you would see if you were aiming a weapon at something. Sometimes, instead of your weapon, you see crosshairs. This coupling of eye and weapon that reduces your virtual body to one function—aim and shoot—gives rise to some of the popular accusations against gaming. The vanishing point of the linear perspective of mobile virtual space coincides with the crosshairs at the center of your field of vision, but what you get in the typical FPS is not true spatial vision, but the view of an image that represents space.

Simulating a physiologically-correct spatial perspective is much more difficult for game engines than just calculating a space. In most games, your view dims and fades only if your avatar dies, while real spatial vision would incorporate dim and fuzzy areas all the time. Flight simulators and racing games are precursors of these three fixtures of the FPS perspective: three dimensions, the coupling of vanishing point and aim, and constructing spatial vision from the image as geometric abstraction. But it is only with the characteristics of action games that the controversy about simulating violent action takes shape. Nonetheless, it is too simple when Jenkins (2006) construes the debate as an opposition between an effects model of thoughtless conditioning and a critical thought model pivoting on meaning and interpretation. Just as the history of the subjective shot in cinema cannot be reduced to making all audience members voyeurs, gaming cannot be reduced to a mere training mechanism. When one considers how to rate the violence of *Quake III Arena* (id Software, 1999), it is important to note that it is set in a futuristic cartoon-world with completely unrealistic weapons; aggression is there for its own sake—for thrills—and not morally legitimated; opponents don't die but respawn—yet the subjective point of view makes the game an intense experience.

There are, of course, other violent games that do not rely on the FPS perspective, and FPS games that have not come under fire for violent content. Interestingly, few of the initiatives that try to allege a link between game content and violent behavior have pointed to horror games, just as the horror film genre is more rarely vilified in such debates than other violent film genres. This may have something to do with how and why people consume such highly popular game franchises such as the *Resident Evil* (Capcom, 1996–2012), *Silent Hill* (Konami 1999–2012), or *Left 4 Dead* (Valve, 2008) series. Indeed, the genre of horror games, going back to other hits such as *Castlevania* (Konami, 1986), again demonstrates a pivotal difference between shooting at aliens or attacking innocent bystanders, between blowing up tanks or taking a chainsaw to a victim.

Theories of Violence

When asking what violence means in games, why it is there, and how it functions, it is best to go beyond the identification of subjective FPS immersion with controversial content, and survey some conceptual underpinnings of the debate. Violence is defined as the intentional use of force, threatened or actual, against a person so as to result in physical or psychological harm. One of the main functions of law is to regulate violence; law enforcement is the principal form of regulation in civil society, whereby police and military are empowered to use some amount of violence. This is rooted in the assertion of individual rights that are defended as inviolable, versus unlawful violence that abridges the rights of others. The freedom to act in defense of one's rights is regulated by jurisdiction and the rule of law (McGregor, 1998).

Thus, some violence is legitimated as a check on violence, while violent acts not carried out by military or police forces are usually categorized as crimes. According to social theory after Hobbes, the force of law is a reaction to the citizens' fear of violence, making civil society a pact that trades individual freedom to use force for collective institutionalized force. With Kant, philosophers therefore distinguish between four constitutional combinations: law and freedom without force (anarchy), law and force without freedom (despotism), force without freedom and law (barbarism), and force with freedom and law (republic). War is a prolonged violent conflict between states; advances in technology have resulted in the rise of large-scale warfare. In terms of sales figures and hours spent, fighting, shooting, and war games tend to rank among the most popular genres both on consoles and on computers.

War games have a long tradition, and were not seen as inappropriate for children all the way through the end of the nineteenth century. Indeed, table-top and floor war games such as *Game of Napoleon* (Parker Brothers, 1883), *Mimic War* (Edgar Clark, 1898), and *Roosevelt at San Juan* (Chaffee & Selchow, 1899), were recommended for children's intellectual development, as they were seen not only to foster historical comprehension but also to exercise strategic and tactical thinking skills (Wells, 1913). It is only more recently, as childhood grew longer and media policy had to cope with larger markets, that representations of violence in games have become a contentious issue (Gentile & Anderson, 2003). Some observers emphasize catharsis—violent games are a means to get aggression out of one's system. This is an ancient theory, applied by the Greeks to belief systems, medicine, music, and philosophy; Aristotle held that the benefit is that it purges the soul of excessive passions. Sorel (1999) also suggests that violence has a cathartic function, an archaic and heroic character that he also sees in class struggle. In this view, violence defines the identity of the proletariat and the stabilization of classconsciousness; to Sorel, the proletarian myth of the violent general strike evokes unlimited action potential. Sorel wrote that bourgeois morals of education promoting peaceful collaboration, while criminalizing violence, do not achieve its aims—on the contrary, Sorel argued that the propagation of harmonizing conflict resolution in fact increases occurrences of violence. Political theory aims to integrate the state monopoly on legitimate physical violence and the idea of peaceful civil society. In turn, other observers of violent games believe that the function of violence is inhibition—players learn in the simulation why such behavior is socially unacceptable; a variation on this argument is that in perpetuating a violent world-view, some games exert a "fear factor" deterrent and discourage violent behavior. However, observers have speculated about desensitizing habitualization, or the belief that players get used to seeing (cartoonish or more explicit) violence and think little of it. Some critics remonstrate along similar lines that games, however violent, are mere simulations, and their fictional or hypothetical settings could not be taken for real by players. However, other critics object that naive imitation or mimetic desire might take hold nonetheless, and players might imitate in their own life the kind of behavior experienced in games. Finally, there are critics who simply assert that games can have no effect whatsoever on players' moral and ethical outlook, because as clearly circumscribed artifacts they are not directly related to reality. The question remains: what makes violent games fun, and for whom? The issue here is less with cartoon violence versus photorealism, arguably; the crucial argument seems to be whether games can be both deterrent and training, both formative and mere entertainment.

Empirical Study

The conceptual dimensions of play touch on a wide range of discourses, including, but not limited to, metaphysics, ontology, epistemology, anthropology, and aesthetics; obviously each of these registers will position violence differently. The long tradition of defining play as child-like, entertaining, and free is countered by arguments about serious play as training, as formative and rule-bound; under such auspices, violent play can be understood as harmless pretense or as preparation for systematic infliction of real harm. Theories of violence distinguish between physical violence that impacts a victim's body, psychological violence aimed at a victim's mental constitution, and structural violence that harms people by preventing them from meeting a basic need, or by corrupting them in ways that leads to detrimental habits (Galtung, 1969). Research has established strong correlations between violence and social factors, including, but not limited to, poverty, substance abuse, and a lack of stable nurturing relationships between parents and children. Empirical studies in media effects research have examined in various ways whether legitimate links can be made between the consumption of entertainment that represents forms of violence and subsequent aggressive or violent behavior (Anderson et al., 2003). Game studies must be informed by such academic studies, not just by anecdotal associations or theoretical constructions, in discussing whether the purported effect of playing a violent game is reducing or increasing the player's own potential for violence. Even if many players might believe that games are an inversion or transformation of our social reality, a counterfactual distraction rather than a depiction of normative or formative behavior, the fact remains that some games can raise your heart rate and affect your mood (Ballard & Wiest, 1996). Durkin and Aisbett (1999) studied 1,310 Australians in a comprehensive survey on gaming; only 3 percent mentioned violence. Trimmel (1996) found that among 1,304 German teenagers, about half talked of frustration and disappointment as factors in relation to regular play. Barnett et al. (1997) analyzed responses from 229 American teenagers between 15 and 19, and found some correlations between low self-esteem and playing with computers; however, there was no correlation between playing hours and aggression, although children who played more video games were seen by their peers as less helpful or friendly. Wright, Boria, and Breidenbach (2002) analyzed in-game communications in *Counter-Strike* (Valve Corporation, 1999) and actually found them to be fostering friendship and community. Anderson and Bushman (2002) explored a "general affective aggression model" in a study with 78 male and 149 female students. Prolonged play of a non-violent game and a violent game for short periods showed that exposure to graphically-violent interactive content increased the gamers' current affective states, including aggression. The effect was clearly moderated by any pre-existing aggressive traits. In other words, long-term play of violent games shows a positive correlation with pre-existing aggression; it leads people who already exhibit aggressive tendencies to manifest that in their behavior (Funk et al., 2002). This should not be misconstrued as a causal relation—it merely points out who is more likely to play the more violent games. Anderson et al. (2003) had 32 students (18 female, 14 male) play two violent games and two non-violent games, and during as well as after gaming, their blood pressure and heart rate were measured, in addition to the administering of a questionnaire. Compared to playing non-violent games, the short-term play of violent games led to higher blood pressure and pulse, higher aggression, and worse moods—affecting most those test subjects who already exhibited a predisposition toward aggression. Frindte and Oberwexer (2003) tested 20 German males between the age of 20 and 25, all experienced gamers, for 10 minutes each; they played *Colin McRae Rally 2* (Codemasters, 2001) and *Unreal Tournament 2003* (Epic Games and Digital Extremes, 2002). Non-violent play raised their pulse, but less so than violent gameplay; short-term play did not make them feel more aggressive afterwards. Anderson and Bushman (2001) saw a correlation, but not a causal connection, between exposure to violence games and a temporary increase in aggression, but Sherry (2001) as well as Ferguson and Kilburn (2009) found that video game representations of violence are not directly related to aggressive behavior in real life. In fact, more recent studies have sought to establish a connection between gaming and civic virtues (Ferguson & Garza, 2011). A large meta-analysis of 130 studies with over 130,000 subjects from around the globe (Ferguson & Kilburn, 2010) found abundant misestimation and overinterpretation of violent video game effects in Eastern as well as Western nations. These studies, in short, establish that aggression is not directly caused or incited by playing violent games, although there is, unsurprisingly, a real correlation between a violent or aggressive predisposition and choices in gaming. When aggression is not pre-existent, playing violent games can raise your pulse and blood pressure, but without raising your levels of real-life aggression. As a consequence, the game industry has rating systems that try to indicate levels of appropriate exposure.

Regulation and Legislation

Different countries have approached this issue in different ways. The main avenues for indication of appropriate exposure are legislation and self-regulation. Non-profit self-regulatory bodies such as the ESRB in the US, the USK in Germany, the IFCO in Ireland, the BBFC in Britain, or the European PEGI rating system independently assign ratings to games as they are published, as a way of informing buyers about the content of these entertainment software packages. Legislation faces the same questions. Several countries have seen laws and regulations proposed that are based not on rigorous study of gaming and its purported effects but on anecdotal connections. It is true that Adam Lanza, the shooter at Sandy Hook Elementary in Connecticut on December 14, 2012, had played *Call of Duty* (Infinity Ward, 2003). It is true that Dylan Klebold and Eric Harris, the shooters on April 20, 1999 at Columbine High School in Littleton, Colorado, played a lot of *DOOM* and *Quake*. It is also true that in 2002, a 19-year-old German *Counter-Strike* fan shot several classmates, and his case led to a new law in German classifying games, similar to the US rating system for movies, though German law already prohibited the depiction of cruel or inhuman acts of violence against humans in a way that glorifies or renders harmless such acts (Ferguson, 2008). NRA spokesman Wayne LaPierre recently alleged that the USA suffer "a callous, corrupt and corrupting shadow industry that sells and sows violence against its own people through vicious, violent video games with names like *Bulletstorm*, *Grand Theft Auto, Mortal Kombat,* and *Splatterhouse*" (Sullivan, 2012). Nonetheless, a recent ten-country comparison of video game spending per capita and gun-related homicides suggests there is no plausible correlation between video games and gun murders (Fisher, 2012). Indeed, as one expert wrote:

> Millions of young people play video games full of fistfights, blazing guns, and body slams. Bodies litter the floor in many of our most popular films. Yet only a minuscule fraction of the consumers become violent. Hence, if there is an effect, children are not all equally susceptible to it.
>
> (Newman et al., 2005, p. 70)

And one might add that a highly popular game, *Just Dance 4* (Ubisoft, 2012), which on its main console platform easily outsells *Splatterhouse* (Namco, 1988), *Bulletstorm* (People Can Fly and Epic Games, 2011), and *Mortal Kombat* combined, has not led to spontaneous dance-offs in the streets of America.

In the United Arab Emirates, a National Media Council controls cultural values in entertainment, banning a long list of games due to violent content. Not all states and territories of Australia have agreed on a national classification system for games; while for a decade the highest rating was MA 15+, some politicians have been pushing for an 18+ rating bracket for games. This is to avoid making age-15 games available to Australians that are not available to minors in Britain or the USA. In 2011, South Australian Attorney General Robert Clark argued some types of games should not be commercially available at all; the list includes *Dark Sector* (Digital Extremes and Noviy Disc, 2008), *Left 4 Dead 2* (Valve Corporation and Turtle Rock Studios, 2009), and *Aliens* vs *Predator* (Rebellion Developments, 2010). Brazil's justice ministry in 1999 banned *Duke Nukem* (Apogee Software, 1991), *Mortal Kombat, DOOM, Blood* (3D Realms and Monolith Productions, 1997), *Postal* (Running With Scissors, 1997), and *Requiem: Avenging Angel* (Cyclone Studios, 1999), threatening stores with fines. In 2007, a federal judge in Brazil added *Counter-Strike* and *EverQuest* (Sony Online Entertainment, 1999) to the index of games that "incite violence," and the national consumer protection agency Procon started enforcing this as of 2008. Of course, not all such bans (or calls for bans) pivot on violence in general—in many cases, a country's specific sensibility plays a role. Mexico, for instance, objects to the portrayal of its citizens in game such as *Tom Clancy's Ghost Recon Advanced Warfighter 2* (Ubisoft Paris and Red Storm Entertainment, 2007) and *Call of Juarez: The Cartel* (Techland, 2011), since they each portray violence in the border town of Juarez. California enacted a law in 2005 (AB1179) that banned the sale of certain violent games to minors; the Entertainment Software Association and the Video Software Dealers Association (now known as the Entertainment Merchants Association) went to court against the bill to block enforcement. Decisions in District Court and Appeals Court considered the constitutionality of the law, and ruled in favor of the industry; Governor Schwarzenegger and his successor, Governor Brown, sought to repeal these rulings before the US Supreme Court. In January 2009, a California bill proposed the Video Game Health Labeling Act (HR231), which would label certain titles with the “WARNING: Excessive exposure to violent video games and other violent media has been linked to aggressive behavior.” However, on June 27, 2011, the US Supreme Court ruled that video games are protected speech under the First Amendment and could not be censored. The California law was struck as unconstitutional, based on the First as well as the Fourteenth Amendments. Other entertainment industry representatives, including the Motion Picture Association, welcomed the ruling (see Norris, 2011; Rousse, 2011; Pollard-Sacks et al., 2011; and Post, 2012).

A Question of Empathy

Arguably, the debate most productively pivots on a solid understanding of the role of empathy in human interaction. We have the capacity to feel for other humans, but there is no empathy between players of a game and the non-human figures of that game; we do not develop tender feelings for an opponent’s pawn in chess, or for characters in *GTA: San Andreas* (Rockstar North, 2004). Fear of sanctions is no adequate replacement for empathy; empathy arises from care and the emotions expressed, received, and reciprocated between parents and children. A lack of empathy therefore arises from lack of shared emotions. It is plausible, then, to stipulate that the psychologically disturbed shooters at Columbine, for instance, may have lacked empathy for their classmates, both due to their outsider role and due to their family situations. It may have little or nothing to do with the content of *DOOM* and *Quake*. In the FPS mode of play, your in-game actions are determined by efficiency and control in the human–machine interaction; but in our lived social experience, solidarity and respect and empathy play crucial roles in how we interact with other people. The issue is one of frame competence: a player might, in extreme cases of immersion or addiction, lose the ability to distinguish real from virtual worlds. When you see a chainsaw, do you think of gardening or *DOOM*, of tree care or of a horror film? In this respect, there is no difference between *Pac-Man* (Namco, 1980) or *Tetris* (Pajitnov, 1984) and *DOOM* or *Halo 3* (Bungie, 2007): in gaming, there is usually little or no empathy even for other players’ avatars. If there is a real danger in exposure to violent games, it lies in excessive play at the expense of other social relations, rather than what is experienced in games. Dynamic transfer from violent games to one’s own social reality is only likely where other relationships that practice empathy give way to gaming in isolation. Children who grow up with healthy relationships to family and friends are unlikely to become psychopaths just because of exposure to violent game content.

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Part VI

SOCIOLOGICAL ASPECTS

44

CHARACTERS

Jessica Aldred

Video game characters are deceptively complex entities: They are at once interactive representatives of the player in the game world, fictional entities that serve to advance the story of the game world, and proprietary symbols of the larger game franchise they belong to, their recognition and value maximized through licensed products. Despite their superficial similarities to characters that originate in other media, video game characters require their own, medium-specific analytical framework to be adequately theorized and understood. Since their representational and ludic traits are subject to the rapid technological changes that typify their nascent medium, this framework must itself be thought of as a moving target. This essay examines some of the major critical debates surrounding video game characters as both player-operated protagonists and licensed franchise intellectual property.

Characters, Avatars, and Agents

Unlike the heroes of other, more traditional media forms, video game protagonists are controlled in some capacity by their player. As such, Andrew Burn (2006, pp. 72–73) argues, they play a dual role as both player agent and fictional character, belonging simultaneously to the "ludic" and "representational" systems that comprise the game (p. 72). Any productive analysis of video game player-characters must acknowledge this duality, and the constantly shifting relationship players experience with their character as a result, oscillating between identifying with the character as an extension of self, and relating to it as a separate, fictional entity. Katie Salen and Eric Zimmerman (2004) have termed this fluctuation the "double-consciousness" of play. According to Salen and Zimmerman, players are constantly shifting between cognitive frames that alternately place them "inside" their character in a relationship of direct identification and very much outside of it, aware of the character as an artificial construct and fictional entity, as well as their own status as players manipulating a tool or "puppet" according to the rules of the game (pp. 453–455).

How, exactly, players experience this "double-consciousness" varies considerably depending on the specific nature of the game character in question. As video games continue to mature as a medium, their player-controlled occupants have diversified according to the growing representational and computational possibilities of each new generation of gaming consoles and PCs, as well as the multiplying generic demands of the games played on them. Player-characters now vary widely in appearance and ability, ranging from the most complex, customizable player projections associated with such video role-playing games (RPGs) as *Fallout 3* (Bethesda, 2008) and *The Elder Scrolls V*: *Skyrim* (Bethesda, 2011), to the larger-than-life superhero icons of such action game franchises as *Halo* (Bungie, 2003, 2005, 2007) and *Uncharted* (SCEA, 2007, 2009, 2011) to the abstracted characters of Facebook and mobile games. This diversity has prompted efforts within both the video game industry and academic studies of games to define and categorize different types of game characters, although little consensus has been reached in the development of an overall vocabulary.

Player-operated characters are often referred to interchangeably as "characters" and "avatars." However, this terminology has been increasingly contested as players, scholars, and game developers alike strive to define precisely what the term "avatar" means, and which games have them. While it is generally agreed that avatars serve as the locus of the player's actions within game space, there has been wide-ranging debate over the specific type of engagement and identity play the figure of the avatar provides the player, as well as the way it balances these ludic obligations with its role as a fictional character.

Avatar has its origins in the Sanskrit word "*avatara*," meaning "descent," and used to describe the visible forms Hindu gods took in our lesser, mortal world. In 1985, the term "avatar" was first used to describe virtual personae in digital worlds; the creators of Lucasfilm Games' early online role-playing game *Habitat* referred to its graphical player-characters as "avatars" over the course of the game's development (see Morningstar & Farmer, 1991), as well as in the context of its fictional storyworld (see, for example, Yakal, 1986). The term "avatar" was also used to describe the player-operated protagonist of *Ultima IV: Quest of the Avatar* (Origin Systems, 1985). But the concept of the avatar was more widely popularized by Neal Stephenson's cyberpunk novel *Snow Crash* (1992), wherein human users operate transformative, photorealistic digital standins called "avatars" in an online Metaverse eerily reminiscent of contemporary virtual worlds. The term avatar has since come to be widely mobilized by video game culture to describe the graphical, typically human or anthropomorphic forms that represent human users in interactive digital worlds. As Tom Boellstorff (2008) observes, while the term avatar "historically referred to incarnation—a movement from virtual to actual—with respect to online worlds it connotes the opposite movement from actual to virtual, a decarnation or invirtualization" (p. 128).

According to one prevalent line of thinking, an "avatar" denotes any stand-in for the player within gamespace, from the simplest abstract gun turrets and space ships of early arcade and console games, to the most photorealistic and customizable occupants of MMOGs (massively multiplayer online games) and virtual worlds. By this formulation, "an avatar will be any game-unit that has action possibilities and that answers to the player" (Kromand, 2007, p. 400). Pioneer game developer Chris Crawford, for example, defines avatars as "virtual constructs that are controlled by human players and function as a means of interacting with other characters" (quoted in Berger, 2002, p. 33). Player-driven "move acts," to borrow Alexander Galloway's (2006) phrase, can therefore even serve as rudimentary avatars, standing in for graphical player-characters via the swiveling, targeting, and steering that indicate and orient the flows of player agency (p. 22). The avatar is, in this most basic sense, the user's representative in interactive digital space, responding to their inputs via the game or computer interface, however simple or complicated those inputs may be. In some cases, this means that the character strongly prioritizes this role of player agent, with a decidedly minimal obligation to any sort of role as a fictional being within the game's diegesis. Packaging and promotional materials supply this fictional layer, however thin, through illustrations and game premise summaries, especially in the context of early arcade and console games. By this very broad definition, then, the sliding "paddle" of *PONG* (Atari, 1972) is an avatar, as are the roving perspectival crosshairs of the tank in *BattleZone* (Atari, 1980), as is the floating cursor in *Myst* (Cyan, 1993), as is *Halo*'s Master Chief, as is a level 4 Tauren warrior in *World of Warcraft* (Blizzard, 2004). Even the rotations and connections of the blocks in *Tetris*, Galloway argues, are move acts that serve to meaningfully represent the player within gamespace (2006, p. 22).

Rather than using the terms "avatar" and "character" interchangeably, some scholars have sought to locate them on a continuum wherein avatars function primarily as projections of their players, while characters may take on strong, fictional identities that are recognizably separate from those of their players. Ragnhild Tronstad (2008) suggests that the term "avatar" should be reserved for those "extended, prosthetic, part-of-our-selves type of character(s)" that prioritize "embodied empathy, in which the player experiences a kind of physical or bodily connection to the character" (p. 256). In so doing, Tronstad echoes James Newman's (2002) influential argument that, in the context of gameplay, player-characters are evaluated primarily as a set of "available capabilities and capacities," rather than their representational traits or rich fictional biography, and that the level of engagement or presence experienced by the player is largely based on the quality of "vehicular embodiment" provided by the player-character:

> This is easier to come to terms with when we think of a racing game like *Gran Turismo* where we drive a literal vehicle, but I am suggesting that, despite their representational traits, we can think of all videogame characters in this manner. On-Line, Lara Croft is defined less by appearance than by the fact that "she" allows the player to jump distance x.
>
> (Newman, 2002)

For Tronstad as for Newman, embodied empathy fosters a mode of engagement wherein the player identifies primarily *as* their in-game representative rather than *with* them as a separate, fictional character. It is this former mode of identifying primarily *as* one's game character as an extension of self that Tronstad deems truly "avatarial," since it most closely emulates the relationship between Hindu gods and their avatars, and precludes the more detached "narrative" empathy experienced with a fictional character in a film or novel:

> In Indian mythology, the avatar is a god's representation on Earth; thus it seems reasonable to reserve the term for player-character relationships in which the character functions as a representation of the player in the game—in other words, for relationships where the character (avatar) has no perceptible identity of its own. To describe the player-character relationship of a player who roams (the game world) as herself, not role-playing and with no consciousness as to the character (avatar) being separate from herself, "avatar" is definitely a better word.
>
> (Tronstad, 2008, p. 258)

For example, Tronstad asserts that the role-playing affordances of such RPGs as *World of Warcraft* may actually make players more cognizant of their in-game representatives as fictional characters, thus preventing these figures from being true stand-ins (and in Tronstad's terms, avatars) for their players: “In role play, the player is more explicitly aware of the character being different from him or herself, having a separate identity with a history, drives, and motivations of its own” (2008, p. 257). When the player constructs their in-game representative to play a specific, coherent role within the fictional context of the gameworld, Tronstad suggests that the resulting figure is best understood as a character, while non-modifiable protagonists such as Lara Croft or Gordon Freeman can be viewed as avatars because their fictional identities may be bracketed off from gameplay such that they serve primarily as vehicles for the player to roam the game-world as “himself” or “herself.”

Other scholars invert this continuum between character and avatar to suggest that that the term “avatar” should be reserved for those figures that don’t just represent the player in the gameworld, but also provide a rich and vital site upon which to “play” with identity. For some, this identity play hinges upon a privileged and highly specific relationship between the player and their digital stand-in wherein the player doesn’t just *control* but also *co-creates* and *modifies* his or her digital stand-in throughout the course of gameplay. Laetitia Wilson (2003) suggests that avatars are virtual selves that stand in for our real-space selves, at the same time as they function “as a locus for our extended agency; a locus that is multifarious and polymorphous, displaced from the reality of our realspace selves” (n.p.).

For Wilson, avatars represent the player at the same time as they permit meaningful experimentation with shifting and multiple identities via the creative choices and interventions users may make upon their avatar’s physical attributes and gameplay capabilities. Building on Slavoj Žižek’s notion of interpassivity, Wilson asserts that video game characters are interpassive entities rather than truly “interactive” ones, soliciting “a mode of relating that involves the consensual transferral of activity or emotion onto another being or object—who consequently ‘acts’ in one’s place” (n.p.). As the interpassive object or “surrogate self” who mediates the user’s engagement with digital space, the avatar provides a locus of agency and positive identity play by allowing the user to become “the author of one’s signifiers” (n.p.). This authorship most obviously occurs in the creation of what Boellstorff (2008) terms “slider selves”—digital stand-ins that can be tweaked and modified using in-game affordances to create the player’s desired representation of him or herself in the world of the game, even if that avatar bears little resemblance to the operator-player controlling them in terms of appearance and ability (p. 129).

The element of creative choice sets avatars apart from video game characters that can’t be modified and customized, facilitating as it does the creation of a “polymorphous” virtual identity that acts meaningfully on the behalf of the real-world user. According to Zach Waggoner (2009), creative choice is crucial to understanding how players become so immersed in video games through their in-game representatives. Waggoner proposes it as the central criteria for distinguishing between those video game characters that function as true “avatars,” and those which only serve as controllable “agents” for their user:

> Pac-Man cannot be altered in any way by the user. He can only be controlled. His appearance and skills can never change throughout the course of the game. That makes Pac-Man an agent. The same holds true for Spacewar’s spaceship, Lara Croft of Tomb Raider fame, Mario of Super Mario Bros, Frogger, Sonic the Hedgehog, Duke Nukem, GTA: Vice City’s Tommy Vercetti, and Perfect Dark’s Joanna Dark. All of these famous

> video game characters are agents, and can only be controlled by the user, never altered in appearance or skill level.
>
> (p. 9)

As will be discussed below, agents play a crucial role as recognizable, consistent icons of the franchise they belong to, their lack of affordances for player modification enabling their ready translation into a range of ancillary merchandise, from action figures to t-shirts to breakfast cereal. In this sense, "agents" more closely resemble famous film characters, and have been a point of convergence between cinema and games since their lack of customizability enables their ready translation across media platforms. Meanwhile, rather than merely providing their users digital placeholders or vehicles within gamespace, Waggoner argues, true avatars afford them the kinds of choices that are crucial to the player's identification with their character. For postmodern identity theorist Diana Fuss (1989), identification is a psychical mechanism that produces selfrecognition, and thus, identity formation—what Fuss terms "the detour through the other that defines a self" (p. 2). Building on Fuss's theory, Waggoner asserts that the avatar can provide just such a detour to its user, the co-creation, modification, and transformation of the avatar as virtual identity/"other" enabling the user's transformation and affirmation of self (p. 26).

Inverting Tronstad's argument, Waggoner contends that role-playing video games (and the high degree of character customizability, multi-faceted attribute systems and complex in-game social relations they afford their users) are the only video game genre that facilitates the creation of true avatars. It is precisely these role-playing decisions, Waggoner suggests, that ensure player investment in their character-as-avatar. In conjunction with a detailed consideration of players who spent extensive amounts of time operating avatars in the role-playing video games *The Elder Scrolls III: Morrowind* (Bethesda, 2002), *The Elder Scrolls IV: Oblivion* (Bethesda, 2007), and *Fallout 3*, Waggoner argues that players

> cannot help but identify with the avatar as they have created it and made decisions through and for the avatar throughout the gaming experience: when to fight, when to flee, when to talk, how to talk, and where to go. These continual decisions made by each user allow for the many psychic self-reflections needed for identification … particularly if the outcome of a decision is not desirable. At the same time, the user remains aware that the … gameworld is not of their own creation—it exists outside of themselves, the virtual creation of others (game designers and programmers).
>
> (Waggoner, 2009, p. 173)

Waggoner contends that true avatars enable the interplay between the user's non-virtual and virtual identities to form a hybrid entity—what James Gee (2004) terms a "projective identity"—that allows both player and character to transcend their individual limitations (Waggoner, 2009, p. 173; see also Gee, 2004, p. 56). While the player remains aware of their avatar as a separate, virtual identity that exists in the context of a fictional, digital world, their constant interventions upon their character ultimately gives way to a successful "blend" of identities that ensures the player-character cannot complete the game without undergoing significant transformation.

Characters as Brands: Movies, Merchandise, and Beyond

Strong, iconic characters have always been crucial to video game franchise brand awareness and marketing, since their distinctive images can be extracted and repurposed outside of the context of gameplay through merchandise and other cross-media spin-offs. This commercial function tends to primarily be the purview of the "agent," since these non-or-less modifiable figures bear the greatest similarities to the ways in which more traditional media characters that have functioned as licensed intellectual property. Even the earliest forays into marketing video games through merchandising—such as those for the arcade hits *Space Invaders* (Taito, 1978) and *Pac-Man* (Namco, 1980)—demonstrated this reliance on character, with the alien attackers of the former and chomping yellow circle of the latter providing a stamp of brand identity to everything from stuffed toys to pajamas to board games to pasta noodles. Given the relative graphical simplicity of these early digital worlds, characters provided the most identifiable means of extending a game into other media and types of merchandise. As the primary means through which players identify with and become invested in a video game, characters provide one of the easiest ways to encourage fans to consume merchandise and other ancillary spin-offs in addition to the game itself.

Movies

Prior to the game industry crash of 1983, video game characters were one of the first sites of convergence between cinema and games. Well-known, recognizable characters that could be readily translated from film to game were crucial to this early period of movie-game convergence, since, in theory at least, these figures were typically the easiest way to tap into pre-existing brand awareness and set new game titles apart in a marketplace on the brink of being saturated by the releases of third-party developers. This character-driven motivation for game licensing was typified by toy and game maker Parker Brothers' foray into video games in the early 1980s, drawing on the well-known heroes of such prominent licenses as James Bond, Spider-Man, and Jaws, to name a few. As the industry-focused "Eye On" section of *Videogaming Illustrated*'s August, 1982 edition observed at the time:

> Recognizing they were wading into heavily populated waters, Parker Bros. decided that going with "famous faces" was the best way to go. "Licensing is a factor which sets you apart to begin with" (Parker Bros. Director of Marketing Richard) Stearns notes. "It gets you recognition in the consumer's mind, and if you can back that edge with very good gameplay, you're on your way."
>
> (Anonymous, 1982, p. 10)

In video games of this era, to be visually "faithful" to a character licensed from an ostensibly "realistic" medium such as cinema was simply to ensure that, in terms of appearance, the character in question possessed at least one trait recognizable from their original medium. The most basic iconography of character thus became key to player recognition, boiled down to one or two essential traits that could be ported across media—Indiana Jones' hat, defiant, arms-akimbo stance and undulating bullwhip, E.T.'s telescopic neck and unexpected speed, The Man of Steel’s billowing cape. In the decades since, the history of the video game character has been defined by an inexorable march toward photorealistic representation as the technology allows, a telos that seemed to suggest expanded possibilities for the convergence of cinema and games. For example, according to its press release, the game *Iron Man 2* (SEGA, 2010) featured “a cast of characters that transports fans into a deeper and more authentic cinematic video game experience” through their overwhelming resemblance to their big-screen selves, while EA’s website for *Harry Potter and the Deathly Hallows Pt. 1* (2010) claimed that advances in facial animation software granted its game characters a new range of emotive expressions, all of which “add to the highly realistic and cinematic feel of the new game.” However, the mixed and, at times, even hostile reception of these photorealistic movie-licensed game characters suggests that *technological* convergence—evident in the shared digital imaging processes that strive to remove the aesthetic distinctions between film and game characters—does not necessarily mean these figures will succeed as converged *content* (Aldred, 2010).

Merchandise

Nintendo’s success in putting forth distinctive characters that translated readily into mainstream child- and youth-targeted merchandise fueled the Japanese console and software manufacturer’s rise to dominance of the North American console market in the latter half of the 1980s. Marsha Kinder (1991) suggests that, by situating the world of video games within other, more familiar contexts associated with children’s culture, video game merchandise sought out a larger audience for the games themselves at the same time as it diversified revenue streams for the game company (p. 109). Children unfamiliar with the games might seek them out after seeing or playing with the toy spin-offs of mustachioed plumber Mario of the *Mario Bros*. series (Nintendo, 1983–present) or the elfin Link from *Legend of Zelda* (Nintendo, 1986–present). Conversely, those players wishing to expand Mario’s or Link’s in-game adventures beyond the finite number of levels of their respective games could do so through imaginative play with the action figurines based on their favorite characters.

Game characters became proprietary symbols, their recognition and value (and thus, that of their attendant franchises) ensured through licensed products. Nintendo’s *Pokemon* franchise still represents one of the most successful examples of character-driven merchandise designed to capitalize on all facets of the youth market. (At the peak of its popularity in 2000, Nintendo had dozens of licensees producing hundreds of different products based on the franchise; see Kline et al., 2003, p. 240.) With a Nintendo Game Boy game that necessitated the capture, collection, and training of various, adorable creatures called Pokemon (or “pocket monsters” in English) at its center, the *Pokemon* franchise created licensed merchandise that was tightly integrated with the game’s focus on creature collection and reinforced by the emphatic franchise slogan, “Gotta catch ’em all!” Younger kids could collect the toys, move on to the trading cards, and then to the various video games in the series. Spin-off animated television shows and a *Pokemon* movie supported this exhaustive, cross-media consumption by emphasizing the name, identity, and importance of collecting each character—who, for example, tended to chant their own names repeatedly, so that children quickly figured out who was who.

The merchandising appeal and potential of prominent video game characters has since come to transcend the boundaries of children's and youth culture. Some of the most critically and commercially-acclaimed console game franchises of the past decade have featured extraordinarily-detailed "collector's edition" models of their most prominent characters, the appearance and hefty price tag of which appeal far more to the adult enthusiast than the doll-and-toy collecting child. For example, a "Fury Statue" of Ezio Auditore, the hero of *Assassin's Creed II* (Ubisoft, 2009), will cost its buyer nearly $500, making the $100 price tag of *Arkham Asylum's* (Rock Steady, 2009) hideous Joker action figure seem a bargain by comparison. Meanwhile, other notable franchises have promoted "limited" and "collector's edition" game releases rife with accessories, costumes, and gear that seek to extend the reach of the character into the player's everyday life—by donning a replica of Cole McGrath's sling backpack from *Infamous 2* (Sucker Punch, 2011), or a full-size Master Chief helmet from *Halo* 3, or even by practicing some unofficial covert ops with a working pair of *Call of Duty Modern Warfare 2* (Infinity Ward, 2009) night-vision goggles. And while it remains doubtful that any hardened criminals are roaming the streets with a replica of Nico Bellic's duffel bag and safety deposit box from *Grand Theft Auto IV* (Rock Star, 2008), the quasi-gritty realism of these items speaks to the widening generational appeal and impact of the video game character, at the same time as it testifies to their complexity as both player-representatives and fictional entities.

As video game characters come to serve as but one node of a fictional identity within a franchise-driven, transmedia landscape that forces the movement of intellectual property across multiple media platforms, their various obligations to the ludic, representational, and extra-diegetic commercial systems that comprise the game and its promotion will increasingly overlap and coalesce. Furthermore, the elision of technological and aesthetic boundaries between video game and cinema characters suggests a future where these boundaries may no longer matter. However, as this essay has argued, it remains necessary to analyze the video game character through a medium-specific framework that acknowledges its particularities—ever changing though they may be—as an object of study.

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45
COMMUNITY
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Players of video games are frequently subject to accusations of antisocial behavior. As early as the 1970s, video games were a source of concern for moral guardians who worried about video games' potential effects on young people. In the wake of concerns that ranged from the encouragement of adolescent truancy to games' violent thematic content and even to accusations of criminal ties in the gaming industry, numerous communities attempted to curtail the spread of video gaming through zoning ordinances and other local measures. In the most extreme cases, video games are blamed for contributing to horrifying acts of violence, such as the 1999 Columbine High School shooting. However, the accusation that gamers are loners or antisocial exists alongside a lively history of community formation around and through video gaming. Even early coin-operated video games enabled various types of community-oriented play: *PONG* (Atari, 1972) was intended for two players, and beginning with *Starfire* (Exidy, 1979), many games incorporated scoreboards, encouraging players to compete and recognizing player achievement. Communities formed by players, game designers, and others with a stake in the medium have a strong influence on gaming culture and shape gaming practice at multiple levels. For example, players develop communities around beloved games just as game companies work to cultivate player loyalty by developing games that require social engagement and supporting communities in and around their games. Indeed, most players will, at some point, engage in some social interaction around video gaming, whether through individual conversations about game strategy, through participation in a social game of some kind, or even through participation in a formal organization or event for gamers. Much of the study of gaming, then, is necessarily a study of community formation and practices. To critically engage with issues of community in video gaming is to carefully examine not only gaming's affect on existing communities, but also the extent to which gaming can inspire and facilitate the formation of new communities around shared texts and experiences.

The centrality of community to gaming has driven much research in fields including anthropology, sociology, psychology, economics, and cultural studies beginning with the rise of coin-op video gaming in the late 1970s and early 1980s sparking investigations of player behavior and gender dynamics in arcades (see, for example, Kiesler, Sproull, & Eccles, 1985). More recent research on the communities in and around gaming has proven a particularly rich avenue for research in the social sciences, and investigations into these communities are at the heart of much video game scholarship, as evidenced by works such as *Communities of Play: Emergent Cultures in Multiplayer Games and Virtual Worlds* (Pearce, 2009), *Synthetic Worlds: The Business and Culture of Online Games* (Castronova, 2006), and *My Life as a Night Elf Priest: An Anthropological Account of* World of Warcraft (Nardi, 2010). Massive multiplayer online role-playing games (MMORPGs) are not the only outlet for socialization in and around games, and many types of game communities present have attracted both scholars and players.

Networking Gamers

Since the beginning of its commercial history in the 1970s, video gaming has served as the basis for numerous kinds of communities. The formation of these game-based communities stems from various aspects of gaming culture. Players may treat gaming as a type of sport, and enjoy competing in leagues or tournaments, both as a way to demonstrate their skill and as a means to engage in a community of players with similar interests. Players may enjoy playing collaborative, community-driven games rather than games that require direct competition. Historically-minded players may enjoy contributing to the preservation of gaming culture and games through public projects. Some gamers may enjoy participating in official organizations associated with gaming to help build a community of gamers, or they may organize officially or unofficially to contribute to the broader community by supporting nonprofit organizations. All of these types of examples demonstrate the myriad ways in which gaming can provide a social outlet and facilitate community building and community-oriented activity.

The networking of games can parallel networking among gamers; the network, then, is both the physical infrastructure that allows gamers to connect their computers to a single hub and the social ties that bind players to a centralized community. The playing of games over a local area network (LAN) has a history dating to early UNIX-based computer games such as *Rogue* (Michael Toy, Glenn Wichman, and Ken Arnold, 1980), which stored high scores on a centralized server, thus allowing players at different terminals to try to beat one another. The hardware and network access required for these games meant they were initially most popular on college campuses. LAN parties, gatherings at which players connect computers to game in a shared space, sometimes for a period as long as several days, provide a particularly evocative illustration of communal interactions around gaming. The increased popularity of personal computers and the proliferation of computer games and high-speed Internet access have not undermined LAN party culture to the extent many might expect. Indeed, LAN parties have become a favorite outlet of participants in custom computer culture as they provide an opportunity to display customized machines for an appreciative audience. LAN parties have significant popularity globally. Organised Chaos (www.oc.co.za/), a monthly LAN party in Cape Town, South Africa, has drawn upwards of 1,200 attendees in 2010. Campzone (www.campzone.nl/), begun in 2001, is billed as the world’s largest outdoor LAN party and is held each year in the Netherlands. BYOC (http://byoc.in/), short for “bring your own computer,” held at various locations in India since 2007, attracts hundreds of gamers and spectators each year. The persistence of LAN (both large and small) in an area with widely available home Internet connections indicates the importance of social engagement and communal experiences for many gamers. In countries where network infrastructure is less robust or less widely acceptable, LAN parties can provide temporary access to faster networks in addition to serving as community gatherings.

Social Games and Social Networks

While LAN parties celebrate the overlap between in-game and in-person social interaction, many games, particularly web-based games, are designed with social interactions as a central part of the game mechanic. Social games—a broad category that can include social media games such as *FarmVille* (Zynga, 2009) and massive multiplayer online role-playing games (MMOPRGs)—require players to engage in the game through a community of other players and may demand players engage in community-building activities such as collaboration, sharing, and helping in order to succeed in the game world (Kahne, Middaugh, & Evans, 2008). While the term MMOPRG was coined in 1997 by game designer Richard Garriott, this genre of community-based game dates much earlier, with early roots in the multi-user dungeon (MUD) genre (Safko & Brake, 2009, p. 411). Contemporary MMOPRGs such as *World of Warcraft* (Blizzard Entertainment, 2004) rely on in-game social organizations called guilds or clans. In-game social organizations such as this have proven particularly of interest to social scientists, and *World of Warcraft*, in particular, has been the subject of numerous studies, such as the aforementioned *My Life as a Night Elf Priest* (Nardi, 2010) and *The Warcraft Civilization: Social Science in a Virtual World* (Bainbridge, 2010). Even in games that do not explicitly reward players for playing in collaborative groups, players will often form their own social clusters in the process of gameplay. Some games, by asking players to choose a faction when setting up their in-game identity, encourage players to interact with others with similar identities. For example, if you choose to play as a goblin, you would be most likely to interact with other goblins. Alternately, different factions may, by design, have different skill sets, thereby encouraging players to seek out others with different skill sets. Some games even include in-game matching systems to help players find groups to play with (Ruggles, Wadley, & Gibbs, 2005, p. 117). Players may play together collaboratively, or they may simply agree to log in to the game at the same time, playing alongside each other or even competitively. While these formal and informal groups ostensibly have gameplay as a goal, they often participate in other social activities and may provide vital social support to one another, as evidenced by examples of in-game weddings and funerals held in recognition of out-of-game events (Gibbs, Mori, Arnold, & Kohn, 2012). These types of events demonstrate the extent to which game communities are analogous to out-of-game communities and meet the social needs of their participants.

Social network games played through social media platforms such as Facebook similarly require players to participate in game play through a community. Games such as *Mob Wars* (SGN, 2008) and *FarmVille* encourage players to leverage their existing social networks for in-game success. In *FarmVille*, players manage farms by managing crops and livestock, and may engage with friends through cooperative tasks, in-game gifting, or by trading goods at the in-game farmer's market. Players in *Mob Wars* may attempt to recruit friends to their in-game mob and send fellow players messages, weapons, and energy boosts. The wide spread of some social media games can be attributed at least in part to the centrality of helping for gameplay; current players will often actively recruit other players, as a larger in-game social network can allow them greater success. In-game interactions for players may be relatively simple, as in *Mob Wars* or *FarmVille,* or more complex as in MMORPGs. Despite differing game styles and levels of complexity, the games are similar in demanding a certain level of social engagement for successful play. For players engaged in various kinds of social games, the community interaction provided by the game is often a primary motivation for gameplay (Ruggles, Wadley, & Gibbs, 2005, p. 115). In these ways, the very structure of games can facilitate and encourage community development and support and sustain communities.

Networks outside Games

While social games present a compelling case of the ways in which video gaming can support community-oriented activity, they are only one of many forms. Indeed, many vibrant gaming communities form around single-player games or other non-networked games, meaning that the games provide limited opportunities for interaction even when played competitively as in the case of many multiplayer arcade or console games. In these instances, a game's format may prevent formation of the types of in-game communities characteristic of social games, but it does not prevent the formation of communities around these games. Beloved and even obscure games may serve as shared experiences for large fan communities. One well-known and highly-documented example of such a community is the community of classic arcade gamers and record holders, which is organized around invites such as the International Classic Video Game Tournament (ICVGT). While most classic arcade games are at least 30 years old, these games continue to attract new players, and competitions and conventions can attract hundreds or even thousands of players. The ICVGT, which has been held annually at the American Classic Arcade Museum since 1999, draws players from across the United States, many of whom return year after year, both to compete in the tournament and to reconnect with friends. While most of the games featured in the ICVGT do not allow in-game interaction between players, the games still form the basis of a large community of people who share game strategies and advice even as they compete against one another, or who more generally enjoy engaging over a shared hobby. Single-player console games may similarly spawn communities of loyal players who gather at conventions and other events.

Conventions and events provide a significant meeting place for gamers across a spectrum of interests. Some gaming conventions predate the popularity of video games and initially focused on other forms of games but have since evolved to feature video games alongside them. Gen Con Indy (www.gencon.com/), which has run for over 45 years, initially focused on war games, and was so small that it was held in an organizer's home. Today, the convention draws over 35,000 attendees and includes computer games and video games alongside other game types. While the expansion of these kinds of conventions is impressive, their humble, small-scale origins demonstrate that they have developed from community-driven gatherings formed around shared interests. By contrast, the Electronic Entertainment Expo (E3) first held in 1995, which is focused on computer and video gaming, is a trade fair that serves as a launch point for publishers and manufacturers wishing to demonstrate upcoming games and merchandise. While E3 is at some level a large gathering of gamers, the focus of the event is on industry rather than on gamers, and it is inherently less community-oriented.

Online Forums

In-person events such as LAN parties, tournaments, and conventions occur as occasional community gatherings, but regular interaction can occur through other media forms as well. Message boards, blogs, and similar online communication tools can provide another avenue for community formation among gamers by allowing them to find others with similar interests. These kinds of tools can augment in-game communities developed through specific games and support connections between individuals with similar gaming interests who may never have interacted in-game. Message boards and forums exist for a wide array of games, including web-based games that already enable player communication as well as classic computer games, phone games, and almost any other type of video game. These online community spaces may be player- or company-supported and may focus on a specific game, a genre of games, a specific console or gaming system, or have a more general focus. For example, Activision supports separate forums for games in its *Call of Duty* (Activision, 2003–present) franchise (www.callofduty.com/community/mw3/forums; www.callofduty.com/community/call_of_duty/english/blackops/forums/), and publications such as GirlGamer also maintain online forums (www.girlgamer.com/). Other forums are supported by other types of groups. The Twin Galaxies Forum (www.twingalaxies.com) is supported by an independent gaming organization that tracks world records. There are even online communities of players who enjoy modding or hacking their gaming consoles, such as Acid Mods (www.acidmods.com), or who enjoy programming games as a hobby pursuit.

The proliferation of gaming-oriented social outlets indicates both a widespread interest in video gaming, and a widespread desire among video game players to build connections and participate in community activities. Player tendencies to form game-based communities are bolstered by the efforts of game publishers. Game design strategies such as those employed in many MMORPGs encourage certain types of player interaction. Out-of-game interactions are also heavily supported by game publishers. Most companies consider player community formation an important goal as it can contribute to customer loyalty, game sales, and brand recognition. Research has indicated that the video game industry exhibits positive network effects—the process whereby the consumer benefits of using a product or service increases with the number of overall consumers using the same (Shankar & Bayus, 2003, pp. 375–378). This means that the spread of a particular game or gaming system benefits not only the companies selling these products, but also the consumers of these same products. The proliferation of official and unofficial accessories for the Nintendo Wii system and the expanding variety of games available through Valve's Steam platform (http://store.steampowered.com/) are two examples of positive network effects in the game industry as they represent an increase in consumer choice and access. Given the potential of positive network effects, companies' investments in game-based communities are effectively a double investment, increasing a game or gaming system's user base, and also increasing the value of that game or gaming system for its users. Such efforts can take a variety of forms.

Official websites and forums are considered vital for most games and serve as the primary means through which players can interact with developers and vice versa. Companies such as Valve and BioWare support official forums to facilitate interactions among those who play their games, and writers, designers, and other company employees often respond to fan feedback. These forums are often managed by paid staff members. The corporate investment in such forums in terms of personnel is often reflected by moderation policies and community guidelines aimed at maintaining an atmosphere that is welcoming to new players and reflects well on the company. Activities and speech in these types of outlets is limited by terms-of-service agreements, but the extent to which these kinds of communities are managed varies widely. Companies may also choose to support unofficial sites developed by fans, by providing official content, offering interviews, and explicitly allowing the use of official artwork or other materials (Ruggles, Wadley, & Gibbs, 2005, pp. 120–121). Game companies may also try to capitalize on gamers' interest in community formation. Microsoft's subscription-based Xbox Live service allows players to collaborate and compete at console games via the Internet in addition to supporting a host of other social and entertainment applications. Games may also charge on a subscription basis, as in the case of *World of Warcraft*.

In addition to the numerous ways gamers form communities formally and informally in and around gameplay, professional organizations of various kinds for game developers and competitive gamers offer a high-profile example of community development in gaming culture. These kinds of specialized, formalized communities may differ in some ways from less-structured gaming communities. Further, as they are highly visible, they may exert greater influence on gaming culture as a whole as standards and practices in these communities may reflect and shape industrial concerns, player interests, and other areas.

Professional organizations for game designers and developers support communities of people working inside the industry. The International Game Developers Association (IGDA —www.igda.org/) is the largest of these, and has chapters spread across the globe. The IGDA advocates for game development as a profession and provides educational and professional development opportunities for its members. Women in Games International (WIGI —www.womeningamesinternational.org/) promotes diversity in the gaming industry. While professional associations such as IGDA and WIGI represent a highly specialized and professionalized effort at community building, they are communities nonetheless and the events, programs, and policies of these organizations provide insight into debates within gaming as a profession. Similarly, members of the Digital Games Research Association (DIGRA —www.digra.org/) participate in a network dedicated to the study of games, and this group of researchers also functions as a community. While there is obvious overlap in various communities of gamers and the community of professional game developers and game researchers, professional organizations are worth considering as separate communities, particularly as they occupy a rather different position with regards to industrial practices and standards.

Gaming Communities in Public

The professionalization of competitive gaming, like the professionalization of game design, has generated communities and community organizations with distinct concerns and practices. Just as there is overlap between the community of game developers and various gaming communities, there is overlap between professional gaming communities and other gaming communities. However, as in the case of communities of game developers, considering professional gaming communities separately from larger communities proves useful as these communities are distinct. Competitive gaming communities may organize around leagues, games, or even sites such as arcades that host their own leagues or tournaments. These types of organizations can exist at a wide variety of scales. Arcades such as Pinballz Arcade (www.pinballzarcade.com/) in Austin, Texas and Family Fun Arcade (www.ffa-united.com/) in Granada Hills, California host tournaments and leagues at a local level, while Major League Gaming (www.major-leaguegaming.com/home) operates as a professional league. The high media profile of certain professional gaming events or circuits shapes and distinguishes competitive gaming communities from other gaming social groups. Furthermore, these kinds of events may influence community standards and practices beyond their perceived boundaries because of media coverage; the growing prevalence of product endorsements in gaming is reflective of this, as companies attempt to cultivate a consumer base through association with highly visible gamers.

Many aspects of gaming culture, ranging from the popularity of social games to the popularity of large conventions, demonstrate an interest in community formation. The numerous communities that exist within gaming culture are not uniform and may vary greatly in membership demographics, interests, and other aspects. In particular, the standards of these communities can be widely divergent, and so discussion of gaming culture as a whole often lacks nuance as it effaces these differences. For example, some player-supported forums may have little to no moderation while an official forum sponsored by a company may require players to sign a terms-of-service agreement that outlines acceptable community behavior. The behavior of players can vary by game or by the forum through which players are interacting. There has been much documentation of the hostility many women encounter in certain online games. However, this experience is not universal and is not representative of all games; while some games may allow or even encourage such hostility, other games may explicitly bar players from engaging in this kind of behavior.

In the case of officially-sanctioned forums, the management of aggression and hostility in the forums can provide insight into company policies and company views of players. A writer for *Dragon Age II* (BioWare, 2011) generated a great deal of attention when he quickly dismissed a player complaining that the game's romance options do not adequately cater to "straight male gamers" (Fahey, 2011). This public dismissal of an individual complaint posted to a public forum allowed the company to demonstrate its interest in providing a gaming environment that is inclusive of diverse players. Official forums and websites are in some ways a burden for companies, as players expect high levels of engagement and responsiveness, but, as demonstrated by this example, these same forums allow companies to actively shape player communities and publicly communicate priorities and expectations.

Debates about community standards in various gaming subcultures are often held through public forums, as was the case when a competitive fighting game player claimed in an interview that sexual harassment is an integral part of fighting game culture (Klepek, 2012). The commentary resulted in a public debate in forums and news sites dedicated specifically to fighting gaming that crossed over to discussion in more mainstream gaming news sites and even on sites tracking gender issues in media. The specificity in the naming of the fighting game community—rather than references to "gaming" in general—accurately demonstrate the extent to which community standards and practices may vary across different gaming communities. The gamer's incendiary comment was specific to the community of which he considers himself a member, and the backlash, to large extent, was also specific to that community. While some gamers may respond dismissively or defensively in response to criticism of aspects of gaming communities, others may choose to engage critically or work toward demonstrating the value of their communities. Child's Play Charity (www.childsplaycharity.org/), a nonprofit organization that provides toys and games to children's hospitals around the world, is perhaps one of the most visible examples of the latter approach. Child's Play was established in 2003 in response to negative portrayals of gamers, and the charity is intended to demonstrate the positive values of many gamers (France, 2004). A defense of sexual harassment in the fighting game community reflects very different values from those that guide Child's Play Charity. For those familiar with the diversity of gaming culture, this difference should be unsurprising. However, these examples do demonstrate the necessity of considering gaming communities as distinct entities. When assessing public debates about gaming culture, separating out the specific community being discussed helps refine insights and enables greater understanding of community norms.

Perhaps the most important principle to bear in mind when considering gaming as the basis for community formation is that gaming communities and gaming culture are not monolithic. Communities reflect not only the differing gaming interests of their members, but also varying standards for community engagement and participation and individual behavior. The concept of community as it relates to video games provides a particularly useful lens for analyzing the cultural practices associated with video gaming. However, it is not a lens that shows a single point in clear focus, but rather one that refracts the image, revealing numerous variations and perspectives.

The substantial level of community engagement displayed by gamers across a spectrum of interests provides a compelling counter to the perceived social ills associated with video game culture. Participation in video game communities can provide a valuable social outlet, facilitating the growth of personal and professional networks, cultivating community-minded behaviors and practices, and offering numerous other rewards for individual participants. Gaming communities, like others, are not uniformly beneficial. The diversity of these communities demonstrates the necessity of individual consideration when assessing the value they hold for members and the potential impact they may have, and suggests the wide range of participants for whom gaming-oriented communities may appeal. As game companies continue to invest in various forms of social games and in supporting forums and other community-building efforts, and as gamers continue to organize formally and informally, community will remain an important aspect of gaming culture for the foreseeable future. By extension, community will also continue as a key arena for games research for scholars working in a diversity of fields interested in the social and cultural implications of games and gaming.

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46

FEMININITY

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Passive, cooperative, and expressive are constructs traditionally associated with females, and by extension, femininity in western culture (Stets & Burke, 2006). Gender identity develops over time and relates to the extent to which a person perceives themselves as conforming to socially-constructed ideals and expectations of masculine or feminine in the world (Stets & Burke, 2006). Cultural expectations have changed such that people are more tolerant of males and females each performing roles and meanings associated with femininity and masculinity in different situations and different points in their lives. Thus, the socially-constructed ideals of femininity overlap with but are no longer synonymous with the female gender.

Video games intricately intersect with gender identity and act as a lightning rod for internal and social negotiations about appropriate portrayals and performance of femininity. Video games emerged as an obscure, novel form of play for adolescent males and have evolved to become a major form of entertainment. Today, almost all teens play games and nearly half of video game players are women (Electronic Software Association, 2012). However, as we know, many game genres remain male-oriented (Lenhart et al., 2008) and the industry male-dominated. In this essay, femininity is considered in regard to video games themselves, video game players, and video game creators. Surprising social media conflagrations occurring in 2012 that could transform the industry in the direction of greater diversity and inclusiveness are also discussed.

Femininity in Games (Game Characters)

Like other popular culture media, video game characters potentially shape players' perceptions of social groups and gender roles through indirect messages. Specifically, players learn societal expectations of appearance, behavior, and role-related behaviors for men and women (Miller & Summers, 2007). The predominantly male sensibilities of conquest and battle continue to abound. Console and PC game worlds are still largely about epic struggles and portray women in stereotypes.

Male characters greatly outnumber female characters in video games, contributing to the characterization of gaming spaces as masculine. A large-scale multiplatform analysis of more than 8,000 characters across 150 video games found that only 15 percent of video game characters were female, and that number drops to 10 percent for female main characters (Williams, Martins, Consalvo, & Ivory, 2009). These results are consistent with earlier studies (Dietz, 1998; Downs & Smith, 2010).

Sexualized female game characters are common in many game genres. Downs and Smith (2010) analyzed 489 characters across 60 games and found that women in games were more likely to be portrayed as partially nude or dressed in a sexually revealing way, with unrealistic body proportions, wearing clothing inappropriate to the in-game activities they were performing. Forty-one percent of all female characters were shown wearing sexually revealing clothing compared to 11 percent of males. Further, 28 percent of all females, compared to 2 percent of all males, were depicted with inappropriate clothing for the task at hand. Female characters were ten times more likely to be shown nude (partial or full) than male characters (43 percent of females vs. 4 percent of males). One-fourth of the female characters was shown with an unrealistic body image.

Game designers at an Austrian game design company working on a male character in a World War II adventure game exemplified this trend. They aimed to represent “the average guy” based on photographs, anatomically correct in proportion, but for a female character they did not use photos as they do in designing male characters, because photos were not “sexy” enough. They used computer-generated images from the Internet and the female character was not anatomically correct (John, 2006). Often when a powerful female game character appears in a game, her appearance is hyper-sexualized. Such a character’s power is transgressive (a strong female in a male world), but hyper-sexualization reinforces their status as objects of male sexual desire (Kennedy, 2002).

It is important to note that not all game genres portray hyper-sexualized female characters. Wohn (2011) looked specifically at portrayals of females in casual games and found that females were overly represented as primary characters, but neither males nor females were depicted in a sexual manner. In other words, representation of females varies dramatically depending upon the video game genre.

Pop culture critic and videographer Anita Sarkeesian (2012) proposed and has been funded through Kickstarter to produce a series of feminist-critique videos about “tropes”—ways females are commonly portrayed in video games. She plans to create videos about 10 tropes: *Damsel in Distress*, *The Fighting F#@k Toy*, *The Sexy Sidekick*, *The Sexy Villainess*, *Background Decoration*, *Voodoo Priestess/Tribal Sorceress*, *Women as Reward*, *Mrs. Male Character*, *Unattractive Equals Evil*, and *Man with Boobs*.

The backstory of Sarkeesian’s Kickstarter project exemplifies the sexism, turmoil, and perhaps signs of social progress that characterize femininity and video games in 2012. In May, Sarkeesian initiated a Kickstarter project, requesting $6,968 to develop short online videos that explore five common and recurring stereotypes of female characters in video games. Her premise was “with a few notable exceptions, basically all female characters in video games fall into a small handful of clichés and stereotypes” (Sarkeesian, 2012). Within 24 hours the initial funding goals had been met, but the project, before production had even begun, was also subjected to coordinated online harassment ranging from hate speech on Sarkeesian’s YouTube video, vandalizing of the Wikipedia page about her, and threatening messages on Twitter, Facebook, and Kickstarter, which included “everything from the typical sandwich and kitchen ‘jokes’ to threats of violence, death, sexual assault and rape” (Sarkeesian, 2012). She was subjected to “image-based harassment” including “vulgar photo manipulation and pornographic or degrading drawings of rape and sexual assault” with her likeness (Feminist Frequency, 2012).

As news of the harassment spread, people began speaking out in support of Sarkeesian. By

December, her Kickstarter project has raised $158,922—nearly $152,000 more than she had originally sought. She added one, then two, and finally a third set of "stretch goals" (to add more videos), all of which were funded. The developments drew attention to hostile, harassing behavior rampant in some parts of the gaming community and they stimulated conversations, spurring blog posts and videos about "why dudes need to tell other dudes to stop making asses of themselves on the Internet" (Smooth, 2012).

This bizarre, intense, hostile, misogynist series of attacks was a response to Sarkeesian's intent to produce the proposed videos. One cannot see or read about this story and fail to assume that females engaging with video games in other ways—simply playing them, or even designing them, risk similar harassment.

Femininity in Gaming (Game Players)

Unlike broadcast mass media such as television, movies, and radio, video games raise the specter of harassment related to gender in part because games are not merely consumed, they are played. For example, like games, there are differences in the kinds of television programs males and females typically like to watch, but there are relatively few gender role expectations regarding how males and females are supposed to watch once they start viewing a program. However, childhood play serves as a mechanism for socialization and internalizing gender roles (Dietz, 1998; Kidder, 2002). Socialization through play extends to gender role expectations about playing video games, and about interacting with other players in video games. The myriad choices players continually must make in a game present opportunities to encounter and consider one's own and others' expectations about femininity. According to Chess (2009, p. 2), "cultural assumptions about feminine styles of play naturally become enfolded into expectations of how women are expected to play." Gender maps onto game genres. The average social network game player is a 40-year-old female, whereas the average console game player is a 37-year-old male (Casual Connect, 2012). Eighty percent of MMOG (massively multiplayer online game) players are male (Williams, Consalvo, Caplan, & Yee, 2009). According to a Pew Foundation study of teens and gaming (Lenhart et al., 2008), teenage boys play for a longer time and they play more different genres of games than teen girls do. Boys play more action, strategy, sports, adventure, first-person shooter, fighting, role-play, survival horror, and multiplayer games. Girls play more puzzle games. Girls and boys are equally likely to play racing games, rhythm games, simulation games, and virtual worlds. Even among players of the same genre, there can be gender differences in players' motivations for playing. Male MMOG players reported being primarily motivated by competition and achievement, while female MMOG players were more motivated by social reasons (Williams, Consalvo, Caplan, & Yee, 2009).

Females may be under-represented in certain game genres not because they don't like those games, but because male players who dominate many physical and social access points actively discourage women from entering (Yee, 2008). For example, the physical space where people play MMOGs affects who can play and for how long. Games played on high-end PCs with Internet access bars access for many demographics (Lin, 2008). Public cyber cafes facilitate access for young males to play MMOGs but are unwelcoming or even dangerous to females (Lin, 2008).

As has previously been described, games regularly include hyper-sexualized female non-player characters. In addition, players are themselves are often represented as a character in the game. Players choose which gender to appear as, and customize their representation within the limits of available choices. Studies have shown that females prefer to play as female rather than male characters (Glaubke, Miller, Parker, & Espejo, 2001; Reinecke & Trepte, 2013). Both females and males avoided choosing avatars that "showed too much skin," preferring a "fully dressed" avatar to a scantily clad one (Barlett & Harris, 2008). Female players, after playing a video game that emphasized the female body, felt significantly worse about their bodies after a game than before playing (Barlett & Harris, 2008).

In multiplayer games, players encounter and interact with other players. The gender of the character they have chosen to play factors into those interactions. Playing an online game while appearing to be female, either due to a feminine name, female avatar, or voice that sounds female, results in different reactions from other players than does playing an online game while appearing to be male. When anonymous players encountered a female conversation agent/avatar, they were more likely to chat about her sexuality, rape, or other aggressive/violent acts against her while advances on male agents were significantly less violent and sexual (De Angeli & Brahnam, 2006). One contributor to a collection of stories about harassment in games pointed out that harassment happens more when VOIP (voice over Internet protocol) is present, because it is harder for potential harassers to be sure they're actually harassing a female when text chat is only way to communicate (Meaningful Adventure, 2012).

The harassment Sarkeesian experienced is all too familiar to many female online gamers. Four female online gamers, fed up with frequent suggestive, insulting, or otherwise offensive comments from other anonymous online gamers ("you play video games? So are you fat, ugly, or slutty?"), started the web site Fat, Ugly, or Slutty to collect these comments. According to the site, "some players like to send creepy, disturbing, insulting, degrading and/or just plain rude messages to other online players, usually women" (Fat, Ugly, or Slutty, 2012). The web site classifies offensive statements into categories including: *Crudely Creative, Death Threats, Fat, Jealous, much?, Jeepers Creepers, Lewd Proposals, Pen15 club, Repeat Offender, Sandwich Making 101, Slutty, Stepford Mentality, Ugly, Unprovoked Rage, Wait, what?,* and *X-rated*.

Female MMOG players often report their female personas are subjected to sexual harassment (Hussain & Griffiths, 2008). Rudman and Fairchild (2004) experimentally tested a model of how harassment can be a form of backlash against violations of cultural norms. Harassing deviants creates strong, social barriers, discouraging deviant behavior. Sadly, in the research, those who sabotaged deviants had higher self-esteem after doing so. In the case of video games, harassment plays a role in maintaining cultural gender stereotypes (such as the notion that first-person shooters are for males only).

Many female players respond to concern about in-game harassment by either trying to disguise their gender, quitting the game entirely, or only playing with known friends online. In online gaming contexts where harassment due to gender is common, such that females are a devalued, stigmatized group. Being female in an anonymous, MMOG is a "concealable stigma" in so much as female players can choose a male avatar and name and try to hide their biological gender. Smart and Wegner (1999) showed that trying to keep a secret (such as being female) may succeed at first, but quickly leads to intrusive, unwanted thoughts about the secret as well as anxiety, distraction, and preoccupation with trying not to think about it. Being female and pretending to be male is likely to impair gameplay performance and enjoyment.

It is not uncommon for males to choose a female avatar, appearing to belong to the devalued group. In fact, male players playing female avatars report being treated better by other male players when they appear to be female than when they play as male characters (Hussain & Griffiths, 2008; Yee, 2006, 2008). Bosson, Prewitt-Freilino, and Taylor (2005) conducted a series of experiments that helps explain why males pretending to be female are less disturbed by harassment. Males playing as a female in a game are pretending to belong to a devalued, stigmatized social group. Knowing they can undo their stigmatized status by a simple disclaimer (revealing their true biological gender) reduces preoccupation with keeping the secret and diminishes distress about being harassed, since they are being harassed based on a fictitious identity.

Femininity and the Game Industry (Game Creators)

Regardless of concerns about representations of female characters, player self-representation, and issues of gender-based harassment, experts in the underrepresentation of women in IT careers express dismay that video games targeting girl players tend to be less likely to include the kinds of features best associated with developing IT expertise (Hayes, 2008). Despite a social context of increased gender and gender role fluidity, video gaming is “culturally coded” male (Ito & Bittanti, 2008). This cultural coding is restrictive beyond immediate implications for recreation because gaming provides an accessible entry point, more so for males than for females, to geek identities and practices such as game modding and customizing that have a side effect of developing technological expertise (Ito & Bittanti, 2008).

Boys’ early and sustained experience with gaming gives them an advantage in building competence and confidence with computers (de Castell & Jenson, 2006). Research by Hayes (2008) confirms that video gaming gives youth practice with digital tools, increasing comfort and basic skills, preparing them for many occupations, and connecting them to larger communities. These benefits are more likely when players go beyond simply playing a video game, and instead also engage in game-related activities such as contributing to an online community blog about the game, producing machinima (video captures of gameplay designed to tell a story), and even developing mods of a game (such as adding new items or other content to a game) (Hayes, 2008).

Despite pervasive gaming by females and males of diverse ages, and a majority of female players in some genres, females are an extremely small minority of game industry professionals, regardless of game genre. Game Career Guide’s annual salary survey found females only comprise 3 percent of programmers, 11 percent of game designers, 13 percent of artist and animators, 13 percent of QA testers, and 16 percent of producers in the game industry (Game Career Guide, 2012). Pratt (2007) argued that women are discouraged from the game industry because of the negative portrayals of women and strong anti-female bias in popular games. Fullerton et al. (2008) suggest that creating more games that appeal to women would help to create a virtuous cycle to draw more women into game creation. They call for “a “regendered” or “degendered” poetics of games that is more egalitarian and acknowledges a wider range of spatial and cognitive preferences.

Unfortunate parallels exist between gender-based harassment in online games and the sexism and misogyny many females working in the male-dominated game industry experience, except that concealing one's gender is not an option. Females in the game industry experience stereotype threat (Steele & Aronson, 1995; Osborne, 2006)—heightened awareness of their minority, outsider status and concern about confirming or being judged in relation to negative gender stereotypes.

On November 27, 2012, Kickstarter employee Luke Crane tweeted "why are there are so few lady game creators?" The hashtag *#1Reasonwhy* exploded on Twitter as female game designers offered reason after reason, such as Jane McGonigal: "because there's not enough investment in AAA games about something other than war, cowboys, football, cars. Sorry, but it's true" and Kim Swift: "because I get mistaken for the receptionist or day-hire marketing at trade shows." Conversations erupted. A female game designer started the hashtag *#1Reasonmentors* to recruit mentors to begin to address the problems. Males and females spoke out against sexism in the game industry (Raja, 2012; Grayson, 2012; Shapiro, 2012). Gamasutra Editor in Chief Kris Graf (2012) listed "resounding calls for diversity and inclusiveness" as one of the top five trends that defined the game industry in 2012, arguing that the industry seemed to have reached a turning point on diversity and gender inclusiveness.

As author of this essay and a female who has been involved in speaking and writing about gender and games as well as studying and designing games for more than a decade, I too perceive 2012 as a transitional year, and anticipate that perspectives on femininity in video games written several years from now will describe very different trends and topics as this industry transforms.

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47

MASCULINITY

Michael Z. Newman and John Vanderhoef

Video games have always been identified with masculinity, and the stereotype of the video game player as a young male endures in spite of efforts to open up play to other identities and to recognize the participation of girls and women in video game culture (Shaw, 2011; Williams et al., 2008). We can think of the gendering of games in terms of representations of masculinity in game images and stories. Just as important, gendering structures the production of games and the experiences of players. We also recognize the intersection of masculinity in both texts and contexts with other identities such as age, race, and sexuality. Despite the existence of diverse participants in gaming, it is young male players who are most likely to identify as "gamers" and who are most often addressed by games and their culture.

Boy Culture in Video Game History

Video games emerged in a context of technology and leisure that gave them meaning. Many types of early games were adapted from distinctly masculinized pursuits and genres such as sports, shooting and battle, science-fiction, and auto racing. Among the notable early games were *Spacewar!* (MIT, 1962), *Shooting Gallery* (Magnavox, 1972), *PONG* (Atari, 1972), and *Space Invaders* (Midway, 1978). Such games offered experiences drawing on a history and tradition of boy culture stressing exploration, fighting, physical skill, and competition (Jenkins, 2006). The video game interface—i.e. the CRT display and controller—combined familiar television technology with military and aviation devices, especially the joysticks and buttons found in aircraft. The iconography of many 1970s Atari games and their illustrations in packaging is evidence of the influence of masculine cultures of entertainment and play: *Outlaw* (1979) is a Wild West shootout, *Combat* (1977) is a tank battle, Maze *Craze* (1978) is a cops-and-robbers chase, *Home Run* (1978) is big league baseball, *Missile Command* (1981) is a Cold War space attack.

Looking at games from the period, it is easy to understand how by the early 1980s, the primary audience for video games had been established as boys aged 8–18, and the game industry had determined this to be their target market (Watkins, 1984). Social scientists studying games in the early 1980s found that video games in the home were played considerably more often by boys and their friends and fathers than by girls and mothers, though among children the balance was better than among adults (Mitchell, 1985; Murphy, 1984). Fathers were most likely to have initiated purchasing video games and were much more likely to play with their children than mothers; the families playing the least were those with only daughters (Murphy, 1984).

At the same time as home gaming was establishing a masculine identity for the new medium, the video arcade emerged as a particularly masculinized public space for play, despite a regular and dedicated female presence (Kocurek, 2012, p. 196). The video arcade inherited some of the disrepute of pinball, and was a youthful destination of strong sensory appeal where players repetitively dropped coins in the slot in pursuit of high scores, eager to beat their friends and impress each other with their abilities. As in earlier generations of public amusement, it was often assumed in video arcades that the masculine role was to play and the feminine role was to watch (Huhtamo, 2005). The cabinetry and content of games was overwhelmingly masculine, with its weapons, spaceships, aliens, race cars, and later on, fighting heroes. When *Pac-Man* (Namco, 1980) emerged in the early 1980s, it was notably different for being "cute" and inviting female players to the arcade (Donovan, 2010, p. 87).

Early home games were often pitched at families even if their most avid players were often boys. In the 1980s and 1990s, boys were more often targeted by game marketing, and the culture of gaming intensified its gendering; for example, Nintendo's blockbuster handheld game device was called "Game Boy." Fighting games in the later 1980s and 1990s, including *Street Fighter* 2 (Capcom, 1991) and *Mortal Kombat* (Midway, 1992), emphasized heroic male bodies in physical confrontation, frequently with bloody displays of savagery. Shooter, fantasy, action-adventure, and role-playing games developed into sophisticated representations of three-dimensional worlds in which players would navigate and explore in pursuit of quest objects and numerous enemies to kill. A "militarized masculinity" defines much of video game culture, emphasizing violence, mayhem, and conquest (Kline, Dyer-Witheford, & de Peuter, 2003, pp. 246–268). A male player is generally addressed in this culture, even when female main characters are represented (typically sexualized).

Early games represented human characters in simplified, abstract forms. Decades of developments in digital graphics have produced games with avatars of detailed human definition. The typical representations of gendered bodies in multiplayer games such as *EverQuest* (Verant Interactive, 1999), in which players choose their own avatar as a virtual identity, are idealized male and female forms. Male avatars have huge muscular upper bodies emphasizing strength and bravery, while female avatars are conventionally attractive, their large breasts revealed by skimpy attire, emphasizing sexual desirability. The gender roles assumed by such representations, T. L. Taylor (2006, p. 113) argues, help such games address a target audience of males 18–30 years old, while marginalizing the many girls and women who play.

At the same time that the graphical sophistication of video games increased, the place of play shifted in many instances from arcades and living rooms to boys' bedrooms. The Nintendo and SEGA consoles of the later 1980s and 1990s along with the PC games of the 1990s fostered a culture of gaming characterized by fast-paced adventure and violence. When the Columbine, Colorado, school shooting in 1999 provoked a moral panic, the common sense of the time suggested that the teenage killers had been influenced by the violent video games they played. Such media had been culturally constructed as a youthful, male obsession, which made it easy to demonize them and assign blame not only for the massacre but for a wider social problem of violent and immoral youth (Jenkins, 2000).

Gender, Technology, and Space

Video games have always been a form of high-tech gadgetry, with every generation of hardware offered as the latest advance. The first computer experiences for many people have been video games, and they have been instrumental in familiarizing children with digital interfaces. Video games offer an excellent example of “the highly gendered character of our relations to technology” (Silverstone & Hirsch, 1992, p. 3), and the social construction of video games as technology has masculinized them throughout their history. This relationship between technology and masculinity is a central dynamic of modern Western societies; technologies including digital games are implicated in the dominant status of masculinity, perpetuating patriarchal gender relations (Cockburn, 1992).

Especially in their overlap with PCs, which have often been used for gaming as much as anything, video games have been central to the development of geek culture, representations of which are ubiquitous in popular culture texts such as the TV shows *Chuck* (NBC, 2007–2012) and *The Big Bang Theory* (CBS, 2007–present). PCs emerged as a hobby of young males. This identity came from the young male spaces of public amusement centers that gave rise to video game culture: “The talk, rules and rituals of game play carried over both into the experience of home-based video game machines and later home computers” (Haddon, 1992, p. 92). Even if girls and women have also been game and computer users, these elements of gendered ritual and language preserve the masculine character of gaming and function to exclude girls and women (Thornham, 2008). A geek culture in which technology is itself fetishized and in which proficiency and knowledge about technology and its uses are prized places video games within a wider sphere of masculinist discourse.

Geek culture’s emphasis on distancing itself from femininity betrays the gender anxiety of its participants. Male computer users are often gendered in two opposing ways. Computer technology is equated with the masculine because of the specialized knowledge and expertise needed to operate it. But computer users are also positioned as emasculated, even feminine men with soft bodies due to too much time spent immobile before screens. These gendered positions extend to video game users, explaining gamer culture’s anxious reproduction of hegemonic masculinity.

The gendering of video games functions clearly in the competitive, noisy, public space of the arcade, but the home has long been the main site of digital play. As Bernadette Flynn (2003) argues, the domestication of video games has been marked by gendered tensions between the feminized sphere of the family home and the masculinized character of games. Unlike television, a technology historically feminized by its location in the home and its association with female users and family unity (Spigel, 1992), video games more often historically resist integration into the routines of family life, though the Nintendo Wii and casual and mobile gaming have intervened in this dynamic (Juul, 2010). Thus, Flynn points out that marketing of video games in the era of Sony PlayStations represents the console as fulfilling fantasies of escape from the monotony of domestic life and its usual media routines (Flynn, 2003, p. 558). The male player addressed by such discourses is represented as shocked and liberated by video games, while the living room is seen to be under attack by the masculine technology (Flynn, 2003, p. 560). Games bring the culture of the arcade into the home, a trope appearing in many advertisements over the years including one for ColecoVision from the early 1980s in which an announcer promises an “arcade experience” even when using a console plugged into the living room TV. In such discourses, we find a negotiation over contested space in the home, with masculine technologies struggling against their location in a feminized sphere (Flynn, 2003, pp. 571–572). As masculinity is often defined first of all by being unlike femininity, video games and their culture often insist on their opposition to the ideal of domestic life as comfortable, safe, and harmonious.

Gamer Discourse and Game Production

As Flynn's discussion of advertisements shows, popular discourse about video games is one key site of their masculinization. A specialist press emerging in the 1980s, with publications such as *Electronic Games* (1981–present), *Atari Age* (1982–1984), *Nintendo Power* (1988–2012), *Electronic Gaming Monthly* (1989–present), *GamePro* (1989–2011), and *Game Informer* (1991–present), shaped the development of video game culture. The titles of these magazines, with references to power, electronics, and professionalism, indicate their gendering. Male writers dominated these publications, targeting a readership of boys—or men who had grown up on early games. This marked a shift away from marketing games to families. Out of this niche press developed a common masculinist language of video game criticism, a canon of games, and the construction of a history. Such video game journalism and criticism continues in magazines such as *Edge* (1993–present) and websites such as Kotaku (2004–present), despite a persistent feminist presence in video game culture and a significant number of gender-conscious writers.

While journalism is maturing toward greater egalitarianism, marketing continues the hypermasculinization of game culture. Many video game scholars find masculinity continually championed not only in games but also in their advertising and promotion (Scharrer, 2004; Dovey & Kennedy, 2006). Official game websites have been found to feature mostly males, to sexualize females they do portray, and to under-represent minority groups (Robinson et al., 2008). Magazine advertisements and official websites position the female and the feminine as other through sexualization and marginalization or else ignore them entirely. If women *are* the focus in the advertisement, they are often ghettoized, limited to interests in self-improvement games such as *Wii Fit* (Nintendo, 2008), *EA Sports Active* (EA, 2009), or *Brain Age* (Nintendo, 2006) (Chess, 2011). Press coverage and advertising construct hegemonic gender hierarchies and marginalize female involvement in video games.

Hardcore video game culture privileges an idealized hegemonic masculinity even while that culture contends with a stereotype of the gamer—the name for someone seriously invested in hardcore PC, Xbox 360, or PlayStation 3 games in particular—as immature, lazy, and boyish. Helen Thornham (2009) argues that in response to the infantilizing of digital games, gamers rationalize and normalize their play to establish an aura of legitimacy. Shaw (2011) posits that players reluctantly identify as gamers despite their gendering because of the medium's abiding stigma. Even as games have become part of an increasingly legitimated geek culture, accepted alongside cars, firearms, and sports as a man's interest, consumption of video games is still marked by gendered anxiety. In an attempt to recuperate authority in the face of this stigma, gaming culture frequently marginalizes identities different from the hegemonic masculine standard, and harassment of female participants is all too common (O'Leary, 2012). When girls and women participate in hardcore gaming, their presence is often qualified by a gendered status: "girl gamers" (or "grrl gamers").

Early work on masculinity and video games assumed they were primarily for children even as this same work aptly explored gender stereotyping in games, gendered game design, and the disproportionate number of men in the games industry (Cassell & Jenkins, 1998). While being careful not to essentialize the preferences of girls and women, more recent research has also focused on the play experience for female players and how it might differ from male experience (Schott & Horrel, 2000; Hayes, 2005). Today, although more females than ever play games, the industry and culture remain fixated on a masculine gamer identity (Kafai et al., 2008).

One important reason for the abiding marginality of the feminine in gamer culture is surely the absence of women from the video games industry. While female players may have increased in number, the presence of female game designers has remained between 11 and 12 percent for years (Miller, 2012). Gendered divisions of labor have historically discouraged women from going into computer science or programming positions. Dyer-Witheford and de Peuter (2009, p. 20) point out that even after the victories of second-wave feminism and an increased presence of women in the workforce, women were more likely to be cleaning the office or acting as secretaries and subordinates in the developing field of information technology. Moving from the manual labor of the factory to the cerebral work of the office, the ideal of “hard” male bodies, which traditionally grounded masculine identities, was threatened by “soft” jobs behind desks. In reaction, computer technology was masculinized in a way that competed with traditional notions of masculinity connected with physical strength and labor. Without the cultural expectation of domestic work, men (and boys) spent more time tinkering with computer technologies or mastering early home video games. The advantage of this high-tech leisure experience combined with a masculinist reaction to the feminizing threat of new forms of labor helped shape digital game production as a masculinized field.

“Crunch time” may be a significant reason for women’s marginality in the video game industry (Consalvo, 2008). Crunch time is the final few months of game development when developers are expected to put in massive amounts of unpaid overtime to achieve milestones and make the scheduled launch window. Crunch time is profoundly aged and gendered, privileging young bodies that can better survive on inadequate sleep and nutrition. Since it demands so many hours, crunch time is impractical for workers with families, especially women who still do most domestic work. Furthermore, such workplaces often expect more from those without families, leaving these people with little time to start them. Thanks to whistle blowers such as “EA Spouse” and calls from the International Game Developers Association, the games industry is taking small steps to reduce or eliminate crunch time even while significant opposition remains within the industry’s upper echelons (Dyer-Witheford & de Peuter, 2009).

Casual Games

The surge in popularity of “casual games” since the early 2000s has opened up gaming to millions of new players, not only threatening the already anxious masculinity of gamer culture but also making possible new conceptions of video games’ gendered status. Featuring visuals and game mechanics simple enough for novices to understand and play, the casual video game opened up a previously cloistered hobby to a mass gaming culture, often feminized and constructed as passive and naive. In contrast to hardcore games, casual games lack complex narratives and feature simple, cartoon-like graphics and intuitive controls (Juul, 2010). Examples include *Bejeweled* (PopCap, 2001), *Wii Sports* (Nintendo, 2006), *Rock Band* (Harmonix, 2007), and *Angry Birds* (Rovio, 2009). Although the definition of casual games is partially based on design features, it is also grounded in a game's relationship to the hardcore video game, an opposition that takes gendered terms.

The casual video game, with its ties to the domestic and to non-gamers, is often feminized, making for a binary of hardcore-masculine/casual-feminine. Casual games such as *Cake Mania* (Sandlot Games, 2006) or *Diner Dash* (GameLab, 2003) indicate why this gendered distinction may cause anxiety for masculine game culture. These games represent feminized activities such as baking and waiting tables, and ask the player to perform these tasks in addition to managing time working to keep customers in the games happy and satisfied (Lee, 2010; Watts, 2010). When casual games enter the popular imagination and become integrated into the identity of video games, core gaming culture feels their already infantilized interest slip toward a feminine gendering. In response, some potentially casual games such as *Rock Band* or *Mafia Wars* (Zynga, 2008) offer an aggressively masculinized address, defending gamers' claim on the medium (Vanderhoef, 2010).

The feminization of casual games in popular and industry discourses allows hardcore gamer culture to position them as inferior and subordinate, lacking seriousness and value, just as femininity is positioned in relation to masculinity. Thus, casual games appear either to be inconsequential or threatening. In the first case, when core gaming culture delegitimizes casual games it does so by adopting the dominant gender hierarchy that always privileges the masculine and devalues the feminine. In the second case, rather than denying their significance, core gaming culture views casual games as a Trojan horse for femininity to creep in and fundamentally alter the masculinity of gaming.

As Judith Butler (1990) has discussed, one has to work continually to perform and maintain any given gender position and that position is never stable. Similarly, many video games do not fit neatly into either the hardcore or casual categories because of the slippery, multifaceted address of any given video game. A game has representations, aesthetic qualities, extratexts, play mechanics, and a myriad of other features to consider when discussing its gendered address. These features can contradict one another and create a multitude of gendered addresses. Moreover, the gendered categories of "hardcore" and "casual" persist even as terms such as "mobile" or "social" also describe games that might be called "casual."

Conclusion: Change from Outside?

The implications of the gendering of video games is troubling to many people invested in games and play. While hardcore gamer culture and the video games industry would surely benefit from progressive change, some suggest we look for new possibilities in alternative sites. The burgeoning independent games movement invites a more diverse understanding of gender and gaming. Like the indie rock culture that developed as alternative popular music, however, the indie gaming space is largely dominated by white masculinities that tend to challenge design dogmas more than gendered hierarchies. Although the documentary *Indie Game: The Movie* (2012) is a poignant examination of the hardship involved in independent development, it still remains a film about a handful of young white men rebelling against an industry of young white men.

Unlike most indie games, so-called avant-garde games offer critiques of not only normalized gaming tropes but also the ideologies that undergird the culture of video games. In *Rise of the Videogame Zinesters*, game designer Anna Anthropy (2012) calls for changing gaming culture from the margins by picking up easy-to-use game creation tools and building the kinds of experiences that represent the currently unrepresented and challenge the otherwise dominant heteronormative masculinity that currently pervades gaming culture. If such interventions make a significant difference, it will be against the background of decades of a thoroughly hegemonically-gendered culture of electronic play.

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48

PERFORMANCE

Michael Nitsche

Background

Performance in video games is often used to describe the effectiveness in successfully mastering a game or game situation. While this remains one aspect, this essay uses a wider approach and borrows from performance as an expressive and artistic practice. Schechner's tentative definition of performance presents it as "*[r]itualized behavior conditioned/permeated by play*" (Schechner, 2003, p. 99). Pelias and VanOosting approach it as "the performative nature of human communication" (Pelias & VanOosting, 1987, p. 221). Whether one traces the origins of performance back to sociology and anthropology or to communication and speech, one core element is shared: performance is about doing. While departments in theater and drama discuss the text, its evolution over time, the stage, the history, and other elements in the theatrical process, performances grow from the act of performing itself. This seems to confine performance art to a subsection of the traditional theater field, but the act of performing has been framed much wider than its initial view of a staged event in the theater. Performance is found not only on a theatrical stage but also in everyday life, religious rituals, or public ceremonies (Goffman, 1959). As a result, a theatrical show is understood as one specific instance of performance practice that is consciously staged and witnessed in a dedicated setting. The overall field of performance appears as a wider perspective that includes any number of conditions and behaviors. Scholarship on this perspective has formed its own academic field since the 1960s, known as performance studies. Performance studies is highly interdisciplinary, drawing connections to anthropology (Turner, 1966), literature (Bacon, 1988), and communication (Conquergood, 2002) among other fields. It lives a life "betwixt and between" theory and practice so that

> [w]e can think of performance (1) as a work of *imagination*, as an object of study; (2) as a pragmatics of *inquiry* (both as model and method), as an optic and operator of research; (3) as a tactics of *intervention*, an alternative space of struggle.
>
> (Conquergood, 2002, p. 152)

Its interdisciplinarity and the combination of theory and practice in the development of engaging expression and inquiry make performance studies a valuable reference point for game studies, where we find a comparable complex relationship between these fields of study.

For example, the differentiation between game and play has been an important debate in game scholarship. One principle suggested in this differentiation is the model of a "magic circle" defined as "form and function play-grounds, i.e. forbidden spots, isolated, hedged round hallowed, within which special rules obtain. All are temporary worlds within the ordinary world, dedicated to the performance of an act apart" (Huizinga, 1950, p. 10). On the one hand, the study of the game itself might focus on the platform, technology, rules, and design among other aspects of the artifact that structure this "spot," thereby mirroring a theater studies approach. On the other hand, a study of play starts with the activity itself and concerns itself with the "act apart," more aligned with performance studies. Both are interdependent but approach the work from different angles.

It comes as no surprise, then, that the discussion of the locale of "play" in performance and video games is equally contested. How do we include the rich context for any play action in our reading of digital media (Consalvo, 2009)? "What does it mean to enter the system of the game?" (Salen & Zimmerman, 2004, p. 94) Is play/performance always "showing doing" (Schechner, 2002, p. 28) or can be more private such as Kaprow's reading of Goffman's everyday routines (Kaprow & Kelley, 2003)? What is the relationship between Kaprow's audience-less happenings and video games (Eskelinen & Tronstad, 2003)? In many ways, the concept of the "magic circle" and the debate surrounding it, are examples of an increasingly fine-tuned approach to interaction, one that benefits from a reference back to performance. It also points out a two-tiered approach: that of the structured experience with the focus on play activity, versus the set frameworks that guide the play.

Theater

Structural concepts of theater have been applied to video game content to create a dramatic arch, shape supportive AI systems, and provide a frame for players and users to engage in. Here, the system provides for expression inside the virtual environment as it turns into a stage for some enacted dramatic plot, a form of "cyberdrama" (Murray, 1997).

Brenda Laurel suggested early on in the discussion of human–computer interaction that different layers of control should engage players in a dramatic action and position them anew:

> He is not playing a game that can be won or lost; neither is he experiencing "real life": he is acting as an agent in a mimetic world. Like an audience member in traditional theater, the user exercises a "willing suspension of disbelief" in order to experience emotions vicariously.
>
> (Laurel, 1986, p. 66)

She suggests that an Aristotelian dramatic arch needs to be included into the design of the virtual world to optimize a player's experience (Laurel, 1991). Others have suggested different dramatic models, but the concept remains one of a structural limitation embedded in the game's system to guide the player along a certain path or into a certain role.

However, these limitations are difficult to enforce in some systems. Massively multiplayer online game (MMOG) environments are so complex that careful planning is practically impossible. This lack of a set dramatic arch allows players to experiment themselves and MMOG worlds have hosted staged dramas since the days of chatrooms, MUDs (multi-user domains), and MOOs (MUDs, object-oriented) (Wunderer, 1999). Open worlds such as *Second Life* (Linden Labs, 2003) allow a wide range of performances, from virtual ballet companies

(Inarra Saarinen's *Ballet Pixelle* with their first public show in 2007) to re-enactments of historic happenings (Eva and Franco Mattes *Synthetic Performances*, 2007) and more traditional theatrical enactments of classics including performances of Shakespeare in a custom-build virtual Globe Theatre. An open world like this provides less structure but more of a sandbox within which players can build their own performative actions—and indeed, in some cases, their own virtual theaters. The Aristotelian unity of action, place, and time was meant to be enforced by the system in Laurel's original work, but now it is up to the player to construct it—or dissolve it. The underlying computational systems are still important but often re-appropriated through forms of emergent play. They exemplify a shift from the design of the game to fit into a theatrical category toward a player-driven re-appropriation of the game through play. Through this play-focused approach, elements of performance have increasingly informed digital media.

Improvisation and Role-Playing

Two important practices of players in their conquest of the virtual stage are role-playing and improvisational theater. With their mixture of given rules and creative freedom to apply them in ever-new contexts, both have become relevant forms of expression in digital environments.

Improvisational theater uses "offers" generated by audiences or players to build scenes on the spot. Johnstone, one of the inventors of modern improvisational theater, defined any action an actor would produce an "offer" for the scene to be created and for actors to be used. Dramatic action is understood by Johnstone as "the product of 'interaction'" which is defined as "a shift in the balance between two people" (Johnstone, 1999, p. 77). With improvisation as a paradigm for video game play, this shift happens between players or between a player and the system. Using improvisation in video game design changes the goal from the linearity of a carefully optimized experience—found, for example, in a railshooter—to the constantly changing dynamics between the players and game systems involved, as in many sandbox games.

The computational system remains relevant and its expressive capabilities continue to affect the range of this improvisation, but they are being exploited by players in new ways as their goal shifted from fulfilling a set in-game target to the presentation of self-defined expressions. Chris Burke's *This Spartan Life* (2005–present) is a virtual live talk show hosted on *Halo: Combat Evolved* (Microsoft, 2001) game servers. Burke and his guests are represented as game avatars talking to each other in the original game levels, while additional player/performers provide "camera perspectives" through their own viewpoints and add music or even dance numbers to the show. The game world is re-appropriated as TV studio and the conventions of a talk show are adapted. At the same time, the underlying game "offers" and pre-implanted functions remain active. Discussions can very well turn into virtual deathmatches where guests and hosts die and re-spawn regularly. Both the talk show, as well as proper gameplay, can include improvisational performance, but the talk show section allows for infinitely more variety through the much richer form of verbal communication, allowing for a "shift" between the partners.

Mateas and Stern's *Façade* (2005) lives on the borderline between interactive drama and video game, as it emphasizes the players' communication with virtual characters. *Façade* still supports a dramatic arc, but the player is encouraged to improvise in relation to the unfolding plot of a derailing relationship between two virtual characters that share the virtual stage with the player. Here, players' improvisation gradually can draw them into role-playing as they can develop role-specific behavior, largely evolving from the socio-cultural construct. A role is often offered to the player with the help of the game's design. *Façade*, for example, stages the player as an old friend visiting a couple in their apartment. One cannot change the location, one is addressed as an old friend, and the virtual characters Grace and Trip reply with surprise if the player leaves this role and becomes abusive, for example.

Role-playing games (RPGs) derived many of their traits from pen and paper RPGs, which already have been identified as performative: Mackay distinguishes between the RPG as theater (defined by the events "*within the context of the game*"), and role-playing as performance (defined by "all of the characters' interactions (the theater) in addition to the out-of-character remarks and events" (Mackay, 2001, p. 53)). This combination of game context and player-defined events is reflected in the evolution of RPGs into their own video game genre, one that has learned to optimize the engaging involvement of the player with the in-game content through one role as in BioWare's *Baldur's Gate* (1998), or at times, multiple roles. The interrelation between the in-game role and the personality of the player was recognized early on as an engaging and educational tool. Players could explore different perspectives toward a given challenge and thus gain a more complete picture of the problem at hand. This multi-role approach is found often in fictional war and race conflicts, as staged, for example, in the MMOG *World of Warcraft* ((Blizzard Entertainment, 2004–present), allowing players to either chose sides or create multiple characters on different sides of the conflict. Exploring the game universe in an expertly-designed single-player RPG such as those of Bethesda's *Fallout* series (1997–present), Bioware's *Mass Effect* series (2007–2012), or Square Enix's *Final Fantasy* series (1987–present), includes an exploration of one's role within these game worlds. Different gameplay options reflect the character traits and illuminate relationships of the player's protagonist to other characters and their stories. The content in these series is largely pre-defined by the game developer but is so vast in its expanse that it takes a very long time to find all possible elements and combinations. Players form their personal playing style, choosing their preferred path or role through a selection of this content.

In the far less pre-defined worlds of MMOGs, role-playing can evolve into its own subculture (Taylor, 2006). Although facilitated by the game system, it remains driven by the participants, who can form communities that can continue beyond the game circle or emigrate between systems (Pearce, 2009). The social construct of one's role and community can become so strong that it can adjust to the design specifics of the underlying game engines.

The question of role and improvisation in relationship to a given game system has continuously shaped the players' involvement with the game as a platform for expressive performance. Whether it is in the exploration of a given role in a single-player RPG, the development of an online character in an MMOG, or improvisational play that teeters at the borderline of the game's intended design, in all these cases players engage in a performative action and their play is not just directed at the best game score but equally about the expression achieved through their interactions.

This becomes particularly clear in the practice of using video games as virtual sets for independent video productions. Machinima artists traditionally use game engines as their production studios and share them online. Countless examples show players performing within the given game setting and demonstrating their skills in playing, but they do not have to stick to the framework provided by the original game. Instead, they often create their own dramatic content, develop roles that counter the given game characters, or comment on them (Lowood & Nitsche, 2011). The video game becomes a canvas for their artistic expression that combines the development of new roles with improvisational theater techniques, as seen, for example, in the work of machinima pioneers such as *Roosterteeth*'s *Red* vs *Blue* (2003–present) series (http://roosterteeth.com/). They combine game conventions with improvisation and dramatic storytelling to create game-based performances.

Questioning the Frame

New formats of this play as performance evolve through the merging of different media in conditions of ubiquitous computing. A prominent hybrid is the alternate reality game (ARG), which combines many different media sources, including web, film, and games. While MMOGs set the stage by providing the virtual playground for the players to enter, ARGs such as 42 Entertainment's *I Love Bees* (2004) do not define the playground upfront through a single media format but instead use any media available to provide a range of challenges that encourage players to meet them through collaboration. They "provide shared scenarios through which gamers interact and collaborate to construct an eventual ending to the story" (Kim, Allen, & Lee, 2008, p. 38). These scenarios are not clear to the player beforehand and players have to find clues at any given moment and in any given circumstance. This weakens the concept of a controlled "magic circle" and exemplifies the entering of performative gaming behavior into everyday life. One design paradigm of ARG developers is "This is not a game!" As McGonigal has argued, these games are a grounded "in a history of embodied play with often indiscernible limits between the ludic and the real, between the game and society, and between play and the real-life behaviors" (McGonigal, 2006, p. 512). ARGs operate along these borderlines as they combine ludic and "real" elements in their design throughout, engaging players across multiple channels to "collaborate" and "construct."

ARGs illustrate the conceptual reach of gaming as performance into transmedial conditions. In parallel, technological developments have pushed video games into the physical everyday world. Mobile devices such as handheld game systems and powerful smartphones spread video games into everyday situations and allow for new forms and new contexts of play as performance. At times, these forms of hybrid play performances are officially-staged public events, but often they blend into the physical world, with the ubiquity of digital media becoming a defining element. The Surveillance Camera Players (SCP) started their performances in 1996 as a protest against existing technology in everyday life. In their case, the technology used includes CCTV cameras that are positioned in public places. To express their concern about this practice, the SCP stage numerous short pieces in public, performed for the eyes of these CCTV cameras. The SCP performances were a playful and theatrical protest: "if the enemy is going to clutter our landscape with watchful eyes, we should look into those eyes and let them know how silly we think they are" (Surveillance Camera Players, 2006, p. 21). While the SCP operated as a protest against the culture of constant observation, other groups, such as Improv Everywhere, embrace technology to create and synchronize their public events that often resemble flash-mob-like performances (see http://improveverywhere.com/).

The merger of ubiquitous technology and public performance has led to a range of art and science projects in video games. These include Blast Theory's collaboration with the University of Nottingham in their hybrid performances that interconnect virtual online worlds with physical performances in urban spaces (Benford & Giannachi, 2011). Their piece *Can You* See Me *Now?* (2001) combines online participation and physical city exploration in a hybrid street race. In contrast, *Day of the Figurines* (2006) uses SMS messages and a model playground to engage players' participation. The pieces differ in their design but aim to "integrate live performance by actors and audiences with digital media and the kinds of rule-based structures that are found in computer games; and establish rich temporal structures in which the artistic experience is interwoven with ongoing everyday activities" (Benford & Giannachi, 2011, p. 1). The result is what Benford and Giannachi call "*mixed reality performances*." Commercial games have tapped into the potential of such a "mixed reality" and various titles involve the use of augmented reality (AR) to create their own hybrid spaces. *Reality Fighters* (SCEI, 2012) stages a fighting game in front of varying backgrounds taken from the back-facing camera of the PSP Vita. The virtual fights seem to happen in the very environment the player sees in front of them. In addition, players can map their own faces onto fighters and customize them to fit their tastes. Other games already address the player as performer directly.

Tecmo's *Fatal Frame* franchise originated on the PlayStation 2, but has spawned off two AR games, one for cell phones, *Real: Another Edition* (Tecmo, 2004), and one for the Nintendo 3DS, *Spirit Camera: The Cursed Memoir* (Tecmo, 2012). Both keep the basic premise of their respective game universes intact. Players still have to battle attacking ghosts through a magic camera that works as a weapon. But while this camera was simulated in the original PlayStation game, it has become the cell phone's camera in *Real* and the 3DS's camera in *Spirit Camera*. In these AR conditions, players are battling ghosts *through* their devices and *in* their mediated physical surroundings. The games create a virtual playground in the surrounding physical environment with the player at its center. Unlike ARGs, these games have a clear framing device: that of the mediating cell phone or game console. However, the ubiquity of these devices and their functionality "anytime, anywhere" blends the stage for their play performances increasingly with the surrounding physical world. The social organization of the surrounding spaces is changed toward a digitally-realized performance space, which ultimately repositions the player.

Closing the Gap Further

New technology, such as mobile and ubiquitous devices, widened the range of expression for digital media as performance. At the same time, performance artists, such as Blast Theory, embraced the new opportunities provided by digital media. Theatrical performances have used media technologies for a long time in the four main categories of set, costume, light, and sound. Digital media have provided better access to stage technologies, leading to "studio laboratories" (Century, 1999), which allows the creation of technological performance work and houses new artistic practices. The film projections of Piscator have been replaced by video projections of today's performances and malleable pixels replace celluloid. Yet, the new technologies have not only supported existing traditions—they also shaped new performance practices and added new layers of expression and involvement.

Dixon traces these developments (2007) and highlights emerging new territories for performance. The evolving connections between digital art and performance art should be considered in game design. When Stelarc connects his body to electronic impulses controlled by messages sent via the Internet in *Ping Body* (1996), he questions the careful control of the single dancer as performer. He also expands the idea of the productive web technologies onto his own body movements. The relationship of body and machine, physical space and mediated environments, or artist and audience, are re-evaluated through digital technology in performances by artists such as Eduardo Kac, Laurie Anderson, or Rafael Lozano-Hemmer. Established performance artists, such as Marina Abramovich, find their work in a new context when digital artists such as Eva and Franco Mattes re-enact their pieces in virtual worlds (see their *Reenactments* (2007–2010) and add new questions to their existing work.

Performance studies encourages the academic domain to discuss these questions and spawns its own debates, such as an extended discussion of the value of “live-ness” in performance art that obviously reflects on games such as *Spirit Camera* or *Reality Fighters*. Phelan stated that “[p]erformance’s only life is in the present” (Phelan, 1993, p. 146), which was countered by Auslander that digital technology, such as a chatterbot, “subverts the centrality of the live, organic presence of human beings to the experience of live performance; and it casts into doubt the existential significance attributed to live performance” (Auslander, 2008, p. 72). Causey extends this discussion beyond media and—much like the ubiquitous computing section above—argues that today we experience the merger of digital technology and performance art through an “embeddedness” (Causey, 2006).

Debates caused by media technologies ripple through performance art. But these new questions not only shape the work of established performance artists, they also offer new approaches for the design and criticism of digital media. It is only through such a combined approach that we can position pieces such as Volker Morawe and Tilman Reiff’s *PainStation* (2001), which punished failure in a two-player *PONG* adaptation with various levels of physical pain inflicted on the player. Gaming, like performance, remains based in people’s actions and performance provides a rich window into their interpretation and future development.

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49

RACE

Anna Everett

When we consider the matter of race in contemporary gaming culture, a few important contextual frameworks come to mind to situate our knowledge of the topic. First, there is the heightened racial framework of American civil society still adjusting to having elected the nation's first bi-racial Commander-in-Chief, President Barack H. Obama who self-identifies, proudly, as black or African American. Second, there is the industry framework driven by the enlarged roles of global audiences and market shares to which game developers cater with strategies and tactics unparalleled even during the golden age of the industry's expansion in the Bushnell and Miyamoto eras of the mid- to late 1970s through the mid-1980s. (Though it is important to add that Miyamoto still reigns as a gaming deity to this day.) Third, there is the digitized race and ethnicity framework promulgated by Rockstar Games's *Grand Theft Auto* franchise that introduced mainstream gaming's most high-profile, if not first-ever, central black protagonist Carl "CJ" Johnson as a must-play character (MPC). Fourth, there is the gender framework following the girl games movement that gave rise to the highly successful Lara Croft game brand at the end of the twentieth century. Fifth, and last for our purposes, there is gaming's networked online framework that has taken the industry by storm and to new heights of social, cultural, global, and financial influence and significance. A through-line transecting each of these frameworks is the often disavowed problematic of racial otherness in gaming's historic march to cultural relevance and power, particularly its masterful arbitration and commodification of contemporary identity politics as play. Put simply, we can ascertain key aspects of gamers' and developers' racial attitudes and assumptions via gaming journalism, blogs, social media platforms (Facebook, Twitter, Instagram, Tumblr), and other online fora.

Race and Games in the Age of Obama?

> Just as narratives, computer games are expressions that, among other things, play a function in the formation of our identity … [W]e could say that the (computer) games we play are nothing but a remote imitation of the infinite play of the world.
>
> (De Mul, 2005, p. 260)

Without a doubt, much has changed even as too much remains the same in the years since journalist Michael Marriott's 1999 clarion call in the *New York Times* for interrogating the limits of the video games industry's treatment of race and ethnicity, and the need for doing something about it. Nothing signals the depth of change in our national mindset and political economy than the remarkable 2008 election and subsequent 2012 re-election of President Obama against formidable odds. Consequently, discourses of race and identity politics in the country frequently toggle back and forth between often naive, well-intentioned rhetorics of color-blindness or race neutrality and emboldened racist rhetorics trading on covert and overt logics of racial animus and entrenched white supremacy.

Clearly, it is not a radical move to situate this interrogation of the gaming industry's meaningful play structures within the crucial sense-making frameworks of racial intelligibility and identification. However, it remains a radical act when game industry observers, critics, fans, designers, and developers resist, call out, and reject the tired, familiar, and damaging racist cultural scripts routinely cloaked in gaming's newfangled technological wizardry and today's powerfully immersive multicultural narrative-quests. More radical yet are those gamer/designer communities of practice who modify and recode our racist cultural scripts to effect antiracist sandbox experiences either in wildly successful game design or pleasurable gameplay, or both. I have in mind here technological innovations in character designs that promise infinitely customizable avatars and gameworlds more attuned to the lived realities and expectations of post-Civil Rights era Millennials, or "Generation C" (for *connect*) as trend watchers for the Nielsen corporation dubs today's "most digitally connected" 18-to-34-year-olds (Fox, 2012). Moreover, these youths' habitual digital connectivity is matched in intensity and ubiquity only by their willing attachments to so-called "addictive" mobile games on smartphones tablets and other toting technologies. Whether or not we are considering the Millennials or gamers more broadly, with respect to categories of epistemic games, serious games, casual games, retro games, and cute games, we understand that none is impervious to the sense-making contexts of volatile and shifting cultural frameworks. Again, these include the winds of historical and contemporary racism or conversely the countervailing winds of antiracist activist practices. For example, the decisive electoral victory of President Obama manifests a transformation of race relations and realpolitik in the US despite a palpable uptick in racist attacks prior to, during, and in the aftermath of the historic 2008 election. In his intelligence report for the Southern Poverty Law Center entitled "Racist Backlash Greets President Barack Obama," Larry Keller (2009) recounts a number of chilling incidents across the country, ranging from official hate crimes to offensive pranks and protests, and most disappointing many involving youths, "students from grade school to college":

> A life-sized likeness of Obama was found hanging from a noose in a tree at the University of Kentucky. The co-owner of a Palm Beach, Fla., restaurant wrote "White Power" on staff memos taped to the eatery's kitchen walls. She told her black employees they would be fired if they voted for Obama … A black Muslim teenager in Staten Island, N.Y., said he was assaulted by four white men who yelled "Obama." That same restaurant owner in Palm Beach wrote "KKK" on employee timecards … In Snellville, Ga., a boy on a school bus told a 9-year-old girl that he hoped Obama would be assassinated. That night, also in Snellville, a vandalized Obama sign and two pizza boxes filled with human feces were left on a black family's lawn. Small black effigies were found hanging from nooses in trees in two Maine towns. In Midland, Mich., a pistol-packing member of the Knights of the Ku Klux Klan wore his Klan uniform and carried an American flag on a city sidewalk.

The point of quoting this stark reminder of persistent racism in US society and culture is to underscore the point that deeply problematic attitudes about race and identity politics continually surface with damaging and dangerous consequences even in the twenty-first century, in the age of President Obama, and in regions all across the nation. It is hardly surprising, then, that cultural narratives about race most familiarly transmitted via theater, print, film, radio, television, as gaming industry precursors of video games in arcade, console, and online formats, become nearly impossible to dislodge. And games, like these cultural modalities before them, help render and standardize historic racial myths as it does myths and discourses of the body, as "Judith Butler speaks of [with her term] 'bodily intelligibility'" (quoted in Richard and Zaremba, 2005, p. 293).

Having emerged now as a media industry giant and a potent cultural force, the video/computer games industry and the narrative texts it creates, promote, sell, and profit from both racist and antiracist cultural values. The significance of gaming discourses of race is, as Jos de Mul points out (2005, p. 262), that

> computer games are not "just games" but play a constitutive role in our cognitive development and in the construction of our identity … You have to do more than identify with a character on the screen. You must act for it.

"Identification through action," de Mul continues, "has a special kind of hold" (2005, p. 262). This special hold is at the crux of our concern with race in games' arguably heightened identification affect over traditional discursive forms such as print and film. Identification with games "might be more intense than in the case of narratives," de Mul suggests (2005, p. 262). And if we accept gaming's growing influence on identity formation and normative racial discourses in society, and especially on Generation C, our investigation into the twinning of gaming and race takes on a particular urgency.

Furthermore, confused public discourses about video games more broadly undergird contradictory logics about the medium's newly embraced beneficial roles in society, including its ability to spur pre-science, technology, engineering, and math (STEM) learning in youths, and to improve physical and cognitive skills in elderly populations (Castillo, 2013; Nauert, 2012). In addition, public discourses about video games also maintain a heightened scrutiny and condemnation of sexist and misogynist content in gaming narratives, play structures, and their "procedural rhetorics," to use Ian Bogost's (2008, p. 125) terms. Concern about the problematic nature of gaming's gender dynamics is ongoing in academia and more so in the blogosphere. Now, the racial problematic in gaming is finally garnering some of the scholarly and popular attention or scrutiny it has long deserved.

A Proliferation of Racially Diverse MPCs

It is true that numerous successful game titles and franchises featuring racially diverse MPCs and optional-playable characters (OPCs) have become widely available. Some of the most racially-inclusive mainstream/popular games developed over the decades and in recent years are: *Final Fantasy* (Square Enix, 1987–2013), *Prince of Persia* (Brøderbund, TLC, Mattel, Ubisoft, SCEJ, 1989–2010), *Madden NFL* (Eletronic Arts, 1992–2013), *FIFA International Soccer* (EA Sports, 1993–2012), *Resident Evil* (Capcom, 1996–2012), *Half-Life* (Valve Corporation, 1998–2007), *Tiger Woods PGA Tour* (Electronic Arts, 1999–2013), *Blade* (Activision, 2000), *Halo* (Bungie, Ensemble Studios, 343 Entertainment, 2001–2012), *Grand Theft Auto* (Rockstar Games, 2002–2013), *Battlefield* (Electronic Arts, 2002–2013), *Call of Duty* (Activision, 2003–2012), *Men of Valor* (Vivendi Universal, 2004), *NBA Ballers* (Midway, 2004), *NFL Street* (Electronic Arts, 2004), *Afro Samurai* (Seven Seas Entertainiment, 2009), *Prey* (2K Games, 2006), *Gears of War* (Microsoft Game Studios, 2006–2011), *Saints Row* (THQ, 2006), Mass *Effect* (Bioware, 2007–2012), *Left 4 Dead* (Valve Corporation, 2008), *Prototype* (Activision, 2009–2012), and *StarHawk* (Sony Computer Entertainment, 2012).

Now, *Assassins' Creed 3: Liberation* (Ubisoft, 2012) is a special title in the franchise produced exclusively for the PlayStation Vita handheld gaming device and it marks a unique offering that fuses both race and gender in one powerful action-adventure character design (more about this later).

For some time, as the abovementioned titles suggest, games companies have targeted African Americans, Latino/a Americans, Asians Americans, Native Americans, Arabs, and other Others (though not in equal measure) as a deliberate business model of product expansion. After all, as Erica Saylor (2012) observes in "Latinos Drive Video Game Sales," the gaming industry is well aware that this gamer demographic considers video games as a primary source of entertainment by 32 percent more than others. "According to Microsoft Xbox sales," she writes, "Hispanic gamers contributed to 23% [industry] growth while non-Hispanic gamers grew [by] a sheer 10%." Referencing *Call of Duty: Black Ops II* (Activision, 2012), Saylor alerts us to the game's Latino MPC named Raul Menendez, a political activist or narco-terrorist hailing from Nicaragua ("Latinos Drive"). Despite crafting a lead Latino playable character (PC) in one of the world's most popular and lucrative franchises, *Call of Duty: Black Ops II* is not likely to spur an industry rush or avalanche of Latino/a themed games or heroic Latino/a protagonists to satisfy one of its largest and most loyal fan bases.

Frederick Luis Aldama (2012) posits a possible rationale. He contends that a plethora of Latino OPCs and MPCs can be found in successful genres, which serve to mollify if not fully satisfy this gamer clientele. Acceptable archetypes such as footballers, gangsters, matador-style warriors, and other underworld stereotypes dominate several games in the *Grand Theft Auto, Tekken, Madden, FIFA*, military combat, and first-person shooter game franchises. Furthermore, some niche and mainstream games provide dialogue/audio in Spanish (Aldama, 2012, p. 359). That said, Saylor and Aldama emphasize that gaming's representation of underrepresented racial and ethnic groups (especially Latinos) remains woefully incommensurate with their demographic percentages in society, and within the industry's own market shares.

Still, a key part of gaming's steady rise as a media industry powerhouse and formidable rival to motion pictures and other big entertainment media corporations is its ability to keep pace with changes in social and cultural norms. This means game narratives, genres, worlds, and characters necessarily have evolved. New and established game titles and franchises now feature MPCs and PCs that are racially and ethnically diverse.

I have argued elsewhere that *Grand Theft Auto: San Andreas*'s African-American character Carl "CJ" Johnson (the gang-member protagonist) and *Grand Theft Auto: Vice City*'s Italian American character Tommy Vercetti (the mafia protagonist) provided the preeminent racial MPCs outside of gaming's privileged masculine archetypes of heroic whiteness (Everett, 2005).

In fact, Rockstar Games's creation of CJ and Tommy as bankable gaming stars foregrounding race, masculinity, and ethnicity was the precondition that made it possible for other racially and ethnically defined MPC and PC types. These include Mass *Effect*'s black soldier Commander John Shepard, *Men of Valor*'s black Vietnam veteran Dean Shephard, *Starhawk*'s black gunslinger Emmet Graves, and *Resident Evil 5*'s black African woman bioterrorism fighter Sheva Alomar, and many, many more.

At Last, Black Women Are PCs

I play, therefore I am.

(Jason Callina et al., 2011)

As we have been observing, there is an interesting and obvious shift occurring in gaming's engagement with race. A striking case in point is the industry's discovery of black heroines as badass action-adventure types on the order of Lara Croft (*Tomb Raider*) and D'arci Stern (*Urban Chaos*). Now, black women, as well as other women of color, are feasible as MPCs and PCs in popular game series and franchises unlike in previous eras, except for Zelda, the enduing fantasy-adventure genre character. Among the dominant game companies leading in this practice are Capcom with its 2008 release of *Resident Evil 5* that features one kickass woman MPC of African descent, Sheva Alomar, and Ubisoft, most recently, with its 2012 release of *Assassin's Creed 3 (AC3): Liberation* featuring kickass black heroine number 2, Aveline de Grandpre, an African-French avenging assassin rampaging through a historic antebellum gameworld set in eighteenth-century New Orleans.

And though these powerful characters foreground race less stereotypically in some respects, online debates about the confluence of race and gender in popular gaming underscore aspects of these character formulations that redeploy stereotypical racial tropes and persistent reifications of black and other women/girls of color as gaming's ultimate outsiders, players, and characters alike. Nonetheless, it is important to acknowledge Sheva Alomar's and Aveline de Grandpré's departures from black female characters largely overrepresented as non-playable victims of gaming violence. As recent narrative agents in action-adventure, open-world, and first-person and third-person-shooter genres in mainstream, casual, and online gaming spaces (including networked gaming such as Xbox Live), gaming's women of color characters are redefining the gaming experience in general, and in terms of twenty-first-century multicultural, multiracial, heroic character ideals in particular.

Alerting us to one particular instance of black women redefining their gaming experience is Kishonna L. Gray (2013) who investigates sexist and homophobic taunts and other oppressive gameplay practices within Xbox Live's various gaming communities. Centering on networked *Gears of War I* and *II*, and *Call of Duty 4: Modern Warfare* games, she considers how black and Puerto Rican women clans and guilds intentionally harass, disrupt, and interrupt normal gameplay progression through an oppositional play strategy Gray calls "collective resistance griefing." Their resistance occurs once male players in the session initiate racist and sexist social interactions, usually triggered by calling the women players "bitches," "spics," and "niggers" or by commenting derogatorily on their citizenship status.

Favored griefing tactics for the women are activating the *hardcore* play mode in *Call of Duty*, which permits the women to engage defensively in deliberate friendly-fire kills of as many of their own offending teammates as possible; to create lag and glitches; to enact virtual sit-ins, essentially doing nothing in-game beyond moving the cursor to avoid being booted off the network for inactivity (Gray, 2013). For these heterogeneous black women gamers (English and Spanish speaking, lesbian and straight), collective resistance griefing serves as a means of indulging their fangirl gaming pleasures while opposing oppressive interactions encountered on Xbox Live that Microsoft admins apparently failed to address, at least to their satisfaction. In fact, instead of the male perpetrators being suspended, they report that the complaining women were. Because the membership fees for Xbox Live are significant, the male majority gamers on the network were very upset with these women's acts of "resistance griefing," which was the point precisely. Offline, the women continued their protests and activism by creating websites and blogs to publicize the racial and sexual discrimination they routinely experienced on Xbox Live (Gray, 2013).

Another game engendering new modes of play with race and identity is *Sims 2* (Electronic Arts, 2004). Whereas *Sims* games permit sophisticated racial identity experimentation and commodification or racial tourism, to use Lisa Nakamura's (2000) terms, the game's expansion packs help fuel new creative expressions involving race through the wildly popular practice of machinima. One interesting conflict develops when we consider Cassandra Jones's critique of a 2008 *Sims* 2machinima text entitled "Run DMC *King of Rock (Sims* 2)" created by Rain Arenas. Produced in January 2008, it casts the African American rap artists Run DMC as white. Describing the text on YouTube (Figure 49.1), Arenas writes:

> It's hard to tell in the video, but all of the Sims are composed of Elvis Presley (which I had downloaded from www.modthesims2.com). *King of Rock* was and still is one of my favorite jams from RUN DMC, and the inspiration for this machinima music video.
>
> (Arenas, 2008)

Figure 49.1 Whitening Run DMC: Rain Arenas' *The Sims 2* (2004) K*ing of Rock* (1985) machinima.

Neither Arenas nor any of her viewers or subscribers was troubled by the racial swap. On the contrary, most assertions were "Love it!!" or "Cool." Returning to context, Cassandra Jones troubles this colorblind representational strategy by reminding us of an historical racial problematic attending this machinima modding approach and others of the ilk. It should not be forgotten that such representational economies participate in longstanding appropriations, subversions, and rip-offs of black artistry and cultural productions by white individuals and non-black business interests (Jones, 2011).

Race, as we have been considering, is a complex vector in contemporary gaming structures, narratives, and ludic practices. Coupled with the advent of new digital tools, racial affect engenders powerful participatory cultures of play and critique (Callina et al., 2011; Saylor, 2012; Midori237, n.d.). Leveraging the power of the web, gamers readily talk back to designers and programmers about their own takes on the phenomenon of new racial scripts in the gaming firmament. Most famous in this regard early on were the vociferous commentaries and condemnations that ensued when Capcom unveiled its *Resident Evil 5* game trailer at the 2007 E3 convention. That Capcom was unprepared for the controversy and reaction against its latest iteration of the lucrative *Resident Evil* franchise is telling.

A self-styled "American Geek," calling himself moviebob, like many others, rejected the company's unconvincing rationale of pitting its scantily clad, *one* good black babe heroine as a sufficient counterbalance to the horde of bad black Majini (evil spirit) boyz in the jungle conflict-narrative driving this game (moviebob, 2009). Also of interest here is how contemporary game designers, as well as and fans, engage charges of endemic sexism intertwined with both virulent and genteel or “cloaked” racism, to borrow Jesse Daniels’s (2008) apt usage, in the gaming industry especially following the public relations debacle of Capcom’s *Resident Evil 5* rollout.

Figure 49.2 Sheva Alomar of *Resident Evil 5* (2009).

Screen shot courtesy of http://electricblueskies.com.

Although moviebob is not alone in taking his condemning assessment of *Resident Evil 5* to the digital public sphere, not all commentary revolving around Capcom’s black bombshell, Sheva Alomar (Figure 49.2), was derisive. One young black woman found the character a welcome contribution. Writing under the pseudonym Midori (from a video game character of the old PSX game *Evil Zone* (Titus Software, 1999)), Midori, a self-identified 22-year-old African-American woman was ecstatic after learning of the character’s creation and narrative centrality to the game. She writes:

> [I] decided to click on *Resident Evil 5* … And omg one of the main characters is a BLACK WOMAN!!! I know this might not seem exciting to some but being a black woman myself, and a big fan of videogames I’m just stoked! We get no representation.
>
> (Midori237, n.d.)

As stoked as Midori was, she had not abandoned all critical thinking regarding the representational economies at work in this character construct. She continues:

> Anyway[,] her name is Sheva Alomar and she’s absolutely gorgeous. I believe she’s supposed to be from West Africa (she works for in an organization in West Africa) and she even has a tattoo on her arm that says “soldier” in Swahili. (Nevermind that Swahili is spoken in East Africa, not West) where she’s supposed to be from. lol It’s possible though and I guess we can’t expect too much. lol. The symbol part of the tattoo is from West Africa, one of my friends has that tattooed on his arm. See the tattoo in the last image … it means “soldier.” Isn’t she stunning? It’s about time a black woman is one of

> the leads in a videogame. First Obama, now Sheva … I don't know what to do with myself!: ☺ lol
>
> (Midori237, n.d.)

What is useful about Midori's 2009 post to her website (now defunct) that she calls "The Diary of Midori" is its tally of clearly-delineated black women PCs in video games that totaled approximately five to seven at that point. In addition to Sheva Alomar, the others she identifies are precursors including: Darci Stern from the *Urban Chaos* (Eidos Interactive, 1999) action game, with Stern imagined as a rival to Lara Croft in 1999 for the original PlayStation; Lisa Hamilton aka La Mariposa from the fighter game *Dead or Alive* (Tecmo, 1996); Fran, the non-human character, from *Final Fantasy VII* (Square, 1997); and Tanya from the *Mortal Kombat* brand. Like others online who interrogate the abysmal number of heroic black women characters in gaming, prolific vlogger, Essence of Truth is particularly compelling. Her YouTube channel is devoted to gaming, and she has produced upwards of 160 videos on her channel.

While Essence of Truth and Midori, among other black women social media creators, are serious about their online cultural activism and fan participation in gaming's networked cultures, business practices, and influential cultural capital, they do not seem to take themselves too seriously as their affective labor, and pleasure in being part of a web of social media communities of practice (Wenger, 2006) expresses unequivocally. Moreover, they are not in lockstep, and it is not clear if their social networks and collectives are intertwined at all.

What is clear about gaming's online participatory sectors is the emergence of savvy, passionate DIY citizen journalists who embrace new media's digital toolkits and open-source programs to enact some code breaking and compelling code-shifting (in the linguistic sense) in a process I am calling "gaming race." They clearly understand and master gaming's meaningful play structures and proceduralities (Salen and Zimmerman, 2005; Bogost, 2008), while subverting or refusing some of the suspect racial and downright racist interpellations or identifications many games encode. Issuing public correctives of and challenges to erroneous character designs is one such instance, as Midori demonstrates above by calling out Sheva Alomar's tattoo symbol in *Resident Evil 5*. Gaming race also occurs between gamers who face-off on Twitter and other fora when hotly contested views about race erupt and disrupt self-serving boasts of performance mastery usually concerned with cheat codes, disclosing secret powerups and Easter eggs, etc. in the no-longer homogeneous spaces comprising today's digital sandbox.

As troubling as the often virulent racist rants and intolerant speech are that inundate videogame fora, websites, and other media outlets that dare address the persistence and unacceptability of misogynist and racist representations and cultures in gaming, interesting examples of resistance and pushback are occurring. Moreover, it is important to stress that some of the conversations around race in gaming fora have become more nuanced and thoughtful since 2008.

CJ's Global Progeny: Assassin's Creed's Black Girl Avenger, Orientalism 2.0, and Grand Theft Auto V

The phenomenal success of the *Grand Theft Auto* franchise (Figure 49.3) across racial and ethnic demographics has tracked closely with changing societal attitudes about race and difference for better and worse especially post-9/11, among other seismic cultural changes. For one thing, the rise of networked gaming and its stratified communities of practice have generated the good, the bad, and the ugly of online interactivity and participatory cultures. Whereas the good sees the instantiation of powerful people of color MPCs as exemplified by AC3: *Liberation*'s Aveline de Grandpré, whose narrative power and agency is somewhat curtailed by her temporal displacement to antebellum, pre-Revolutionary New Orleans. And, when considered in tandem with Sheva's strong playable buddy-role in *Resident Evil 5*, Aveline's solo sheroic role marks a crucial turn in gaming's address to race.

Still, Ubisoft has moved gaming's multicultural, mixed-race, and transgender play options forward as evidenced in its guide to *AC3: Liberation* players. In its "Game Overview," Ubisoft writes: "No matter the persona you choose, you are Aveline. Wielding a machete, poison-dart blowpipe, and dueling pistols, you'll master all new ways to hunt down and eliminate your enemies-fighting for your beliefs, your people and your freedom." Returning to our consideration of context, it is not unreasonable to situate Aveline's mixed French and African heritage within a larger discursive ecology of socially-acceptable mixed-race populations in the US following President Obama's public embrace of his own mixed-race lineage, and the burgeoning academic study of mixed-race identity politics. Now, males of all racial and ethnic groups confess online to enjoying gameplay as a powerful black female MPC.

Be that as it may, Ubisoft is not alone in its push beyond the racial boundaries of normative whiteness in building its gameworld temporalities. This brings us to the bad in gaming. We have discussed already, for instance, a potent example of *bad* gaming practices and cultures experienced by women gamers of color playing *Call of Duty* on Xbox Live's online network (Gray, 2013). In our post-9/11 political environments, games companies are discovering Asian as well as Arab, Muslim, and other youths in the Middle East as new market and demographic shares and business opportunities to cultivate. Vit Sisler (2008) notes that digital Orientalism has long been a feature of fantasy and adventure games. But since 9/11 the complexity of Arab nations, the Islamic religion, and Muslim countries have been flattened out essentially into gaming's favored terrorist and Islamic extremist caricatures.

Game developers in the Middle East, Sisler (2008) explains, have in recent years begun to resist and counter such anti-Arab games such as *War in the Gulf* (Empire, 1993), *Delta Force* (NovaLogic, 1998), *Conflict: Desert Storm* (SCi Games, 2002), *Full Spectrum Warrior* (THQ, 2004), *Kuma/War* (Kuma Reality Games, 2004), and *Conflict: Global Terror* (SCi Games, 2005). To re-capture the hearts and minds of young Arabic and Muslim gamers from western media influences, Syrian and Lebanese game developers created *Special Force* (Solution, 2003), *Under Ash* (Dar al-Fikr, 2002), and *Under Siege* (Afkar Media, 2005), military games from their own national and ideological points of view. As Sisler (2008) puts it, "*Special Force* and *Under Ash* can be considered as the first attempts to participate in video games' construction of Arab and Muslim selfrepresentation [*sic*]."

Alternatively, games developer Mahmoud Khasawneh (2011) argues that Western game companies need to partner with Middle Eastern games companies to tap into this potentially highly lucrative market. With a region of more than 400 million people speaking a single language, Arabic, and with half of some populations under age 25, and highly tech-savvy, Khasawneh (2011) believes the

> Middle Eastern gaming industry is likely worth somewhere between $1 billion and $2.6 billion in terms of revenue across software and hardware. Western developers and publishers have the chance to successfully enter and influence a very green and receptive market, ready to be engaged and monetized.

Figure 49.3 Grand Theft Auto V (2013).

Time will tell if gaming's address to race will move beyond some of the promising steps it has taken to attract larger and more racially, ethnically, gendered, and other diverse populations in the West and across the globe, as discussed here. Any cursory look at online fora devoted to these new racially-inclusive games reveals enthusiastic gamers embracing novel approaches to race and difference, as well as, unfortunately, persistent racial stereotypes. With Rockstar Games's long-awaited *Grand Theft Auto V* nearing release at the end of 2013, it will be interesting to see what CJ's progeny will portend for race and games in digital times.

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50

SOCIOLOGY

Andras Lukacs

Games and play are historically social activities. While some of the early video games were two-player games, developments in computer technology and network availability allowed designers to create more elaborate multiuser systems. Ever since the release of the first multiplayer online games during the 1970s and early 1980s, people have been gathering online to play, compete, and socialize in imaginary environments. By the end of the twentieth century, multiplayer video games had become an important dimension of online social life and gained the attention of scholars as prominent research venues and subjects.

Sociologists are interested in multiplayer, online video games as a medium for human interactions. Video games are intriguing venues to observe the structures, cultural norms, dynamics, and self-presentations of online social groupings. From the sociological perspective, the ludic and playful dimensions of games, and their storylines and narrative structures, provide a necessary backdrop to understand *technology in use*. Sociologists maintain that games are extensions of the society in which people reside. According to T. L. Taylor (2006), multiplayer online video games are “situational and reliant not simply on abstract rules but also on social networks, attitudes, or events in one’s non/game life, technological abilities or limits, structural affordances or limits, local cultures, and personal understanding of leisure” (p. 156). Games represent another social location from which people communicate and interact with one another on a global scale, yet they are also produced by and, at the same time, are reproducing various relations of ruling.

Several sociologists have studied video games, players, and fandom. Nevertheless, the willingness of the broader sociological community to take virtual gaming seriously is rather underwhelming (Crawford, 2011). Moreover, game scholars have adopted only bits and pieces of the sociological framework. Thus, our social scientific knowledge about games is dominated by an individual and cultural focus, rather than the organizational and group focus that sociologists provide (Henricks, 2006). If presented systematically, the sociological perspective can connect player biographies and localized gamer idiocultures with larger societal developments, existing structures of power and domination. Sociology, rather than being antithetical to the current debates within the field of game studies, can contribute to our existing scholarly knowledge about video games and multiplayer online play.

Methodological Approaches

Existing sociological studies approached video games from quantitative, qualitative, and mixed methodological perspectives. The general techniques and conventions of conducting research remain unchanged in technologically-produced environments. At the same time, researchers are able to take advantage of the digital and networked nature of video game play to collect, process, archive, and analyze quantities of data unimaginable before. Data-mining techniques are capable of producing more data than is manageable or understandable for a fieldworker. Therefore, sociological reasoning in these data-rich environments is still predicated upon an imaginative, critical, and reflexive approach. Methodological choices are best not made a priori, but negotiated in the field with regard to their capacities and to the questions asked (Coavoux, 2010).

Quantitative approaches to video game play research utilize survey methods, client-side data-mining applications or, less frequently, rely on server-side data. Our understanding of basic player demographics and how various titles attract different publics and taste cultures is predominantly derived from surveys (for instance, see Williams, Yee, and Caplan, 2008). Because researchers often lack access to large player populations, industry publications further their understanding of player demographics. Data from the video game industry are invaluable and highlight certain biases that social scientists may have toward game genres. While research about persistent multiplayer games and massively multiplayer online (MMO) games represents a large portion of the social scientific literature of video games, the Entertainment Software Association reports that these games are the favorite online games of only 11 percent of the American consumer base (Entertainment Software Association, 2012).

Jonathan Corliss (2011) believes that the disparity is explained by three factors. First, MMO games are designed around large-scale social interaction, in essence legitimizing video game study as a social scientific enterprise. Second, virtual worlds create distinct cultural fields, and, as such, they warrant being studied in their own right. Third, the interfaces learned and mastered in the context of MMO gaming are increasingly used in the technologies of everyday life.

Many games are designed with an open client-side user interface to allow customizations and modifications by the user community. This enables researchers to develop and use various applications and tools to collect data within the game world. Besides collecting chat-logs and analyzing economic trends, researchers can administer in-game censuses of players. These longitudinal data sets are instrumental in studying the organizational affiliations of characters, changes in various game metrics, and establishing player preferences (favorite map, play mode, etc.). The networked information helps sociologists to move from individual-level analysis and reconstruct organizational level data about social groups (Ducheneaut, Yee, Nickell, and Moore, 2006).

Because online interaction is almost always social-network oriented, social network analysis offers a powerful framework for examining and interpreting social relationships within gameworlds. Data visualization gives researchers an excellent tool for quick pattern recognition. Network density, clustering, and centrality allow comparative analysis between social groupings (most commonly guilds and clans). Community and cohesive subgroup detection is used to understand why certain player communities thrive while others quickly dissolve (Ducheneaut, Yee, Nickell, and Moore, 2007).

Qualitative research methods are especially well-suited to gather in-depth data about the social dynamics and the processes through which players construct their gameworld. Participant observation, one-on-one interviews, group interviews, and focus groups are the most common techniques sociologists use to understand the negotiation of identities, social roles, and status.

Qualitative methods allow researchers to look at the social dimensions of gameplay from the perspective of players. The aim is not to elucidate a totalizing understanding of social behavior, but to connect seemingly incidental occurrences of social exchanges (Boellstorff, 2008).

Theoretical Foundations

Sociology is less concerned with the narrative structures and rules of video games, and more interested in the emergence of social practices and idiocultures within and connected to gameworlds. Social structures frame the play experiences and expressive life of humans. The rich history of sociological theory provides powerful tools to understand the role of play and fantasy in everyday life. However, as Henricks (2006) reminds us, the sociological perspective is rarely presented in a systematic way in the game studies literature. Currently symbolic interactionism, an approach that places emphasis on communication and the ongoing presentation of social selves, is the most widely used sociological theory in video game studies. While it is tempting to bring in symbolic interactionism as the primary model of social theory to explain in-game behavior, other theoretical approaches are equally useful, yet often overlooked.

While having a broader scope than video games per se, Henricks's theory of play is the most complex, but surprisingly overlooked sociological approach to games to date. Henricks does not claim superiority of the sociological approach over existing scholarship, but attempts to complement the individual and cultural orientations toward play with a sociological, structural viewpoint. For him, play is a mode of expressive behavior (as an action or performance of an individual) and a mode of social interaction at the same time. Influenced by the classical sociological thought of Karl Marx, Max Weber, Emile Durkheim, Georg Simmel, and Erving Goffman, Henricks's perspective frames play as a complicated interaction between people and the social conditions of their lives. *Play Reconsidered: Sociological Perspectives on Human Expression* (2006) argues that play can only be understood relationally to other, not necessarily dissimilar and unconnected social categories, namely work, ritual, and *communitas*. He proposes that the relationship between these classifications can be analyzed by looking at degrees of contestation and predictability. Play and work represent contestive social activities; *communitas* and ritual are cooperative and unifying. On the one hand, work and ritual signify a more or less predictable, scripted mode. Conversely, play and *communitas* are less ordained and more spontaneous.

This model helps us understand the complex geometry of relations within gamespaces. Modernity and the rational, bureaucratic organization of social life established the dichotomy where work is seen an instrumental, rational, economic activity, while play is perceived as frivolous and unproductive. Yet, this relationship is much more complex, and fetishized instrumentalism is a central part of modern video games. This work and play antinomy has received considerable attention in video game studies (for instance see Yee, 2006; or Silverman and Simon, 2009). Scholars have established that the metaphor of labor is, indeed, useful for understanding user experiences. Recent scholarship by T. L. Taylor (2012) documents how games morph into professional, competitive e-sports with cyberathletes, teams, leagues, sponsors, and fans.

Ritual and *communitas* refer to the integrative elements of play. While game architectures are based on a certain degree of randomness and unpredictability, gaming communities participate in rituals that have a predictable, orderly, and even scripted quality. To partake in a ritual is to be part of something that transports players through the minutiae of life. Rituals are part of video game play: rich ethnographies describe the significance and meaning of various role-playing rituals (weddings, funerals, clan gatherings, initiations, etc.) in virtual worlds (Pearce, 2009).

Finally, *communitas* expresses an integrative, unpredictable mode of relationship. In great moments of collective festivity, players feel themselves caught up and carried along in a surge of public energy. Collective effervescence, the experience of pure sociality can overwhelm any commitment to rationality and competitiveness. This pure sociability is the basis of burgeoning fan communities. Audience studies have focused mainly on the player as the primary audience of a video game, but with the proliferation of live-streamed gameplay, we have seen the player emerge as a performance artist and object of fandom.

Henricks's typology is helpful to conceptualize relatively stable collective participation frames within games. *Frames*, as a sociological concept, is built upon the understanding that finite worlds of meaning constitute human experiences. Erving Goffman (1974) argues that frames—some fickle, others comparatively more stable—construct social boundaries and provide interaction cues to shape events and participants' experiences of said events. The construction and interpretation of frames does not happen in a vacuum, even though virtual realms create imaginary worlds of fiction. Thus, as players switch from game to game, engross themselves in high fantasy or dystopian science fiction, hop from game server to game server, play on consoles, smartphones, or PCs, or change game modes, their ability to interpret these experiences remains the same. As Gary A. Fine (1983) demonstrates, tabletop role-players rely on a few stable frameworks to be guided throughout gameplay, despite the co-existence of other, simultaneously existing frames at the same time. These stable frames are part of video game play as well.

The frames of work, ritual, and *communitas* are advantageous to understand various social groups' orientation toward gameplay and provide a sociologically-grounded approach complementing Richard Bartle's individual player orientations established in 1996. Bartle categorized players according to their play style as achievers, socializers, explorers, and killers. While frame analysis is more focused on interaction and culture, rather than rules and structures, Pierre Bourdieu's notion of *field* is useful to understand how stable frames provide concrete social contexts to govern participation and constitute spaces with their own logics of functioning. A field is a certain distribution structure of valued social assets or capitals, but it is not a product of a "coherence-seeking intention or an objective consensus […] but the product and prize of permanent conflict" (1993, p. 34).

To adopt a frame or to enter a field, players are required to embrace the tacit participation rules of a game. Participants are required to possess the required *habitus* (a matrix of perceptions, appreciations, and transposable dispositions generated by class, race, and gender positions), knowledge, and skills to be seen as a legitimate player. Participation also means investing one's (cultural, symbolic, academic) capital to try to maximize profit from participation. The notions of field, habitus, and capital embrace the dialectics that while social structures have subjective consequences, the very structures are built by individual actors.

Of course, some of Bourdieu's work has already been adopted by video game studies. Thomas Malaby advocates the use of cultural capital to understand how players move between various virtual settings and the physical world (2006). Lukacs documents how social class and gender dispositions shape interaction within virtual realms (2011). At the same time, field and *habitus* are undertheorized and underused, even though these concepts anchor players in their everyday social networks while maintaining the relative autonomy of gaming idiocultures.

Both Goffman and Bourdieu stress that frames or fields, whether in gaming or other cultural spheres, are not mirrors of dominant ideologies. They have their own transformation rules. External determinants can have an effect only through the transformation in the structure of the field itself. In this sense, frame analysis from a symbolic interactionist perspective, and the concept of field-habitus from a more structural approach, both help game researchers to contextualize play experiences and connect them to larger societal processes.

Game Worlds and Social Play

As Crawford (2011) noted, the contribution of sociology to video game studies is still a significantly underdeveloped area. At the same time, the "social element" of online games has received considerable attention from researchers of various disciplinary backgrounds and perspectives. These scholars borrowed freely, although not necessarily in a systematic manner, from the sociological tradition to examine the relationship between game design and the development of social institutions, grouping patterns, the presentation of virtual selves and most importantly, persistent social groups (guilds) that provide a stable enough social setting to most game activities.

The "social element" of games develops through an interaction between the structure of the game itself and the social, cultural practices that emerge in and around game titles, franchises, and genres. Off-the-shelf products rely on certain collaboration infrastructures (communication tools, networking tools, and persistent social groups) to encourage the development of in-game sociability. According to economist Edward Castronova (2005), the most important design choices affecting social institutions in MMO games are:

- character roles (division of labor);
- character advancement through various in-game capital accumulation;
- uneven distribution of social status;
- risk and danger as an incentive structure;
- scarcity of resources and forced cooperation;
- communication infrastructures; and
- personalized game content and artificial intelligence.

These design choices offer affordances and social interaction possibilities for users. In this sense, online games as engineered social spaces are fascinating laboratories to observe the intended and unintended consequences of certain design choices.

Ducheneaut, Yee, Nickell, and Moore (2006) offer quantitative insight into the grouping patterns of a popular MMO game, *World of Warcraft* (Blizzard Entertainment, 2004), indicating that despite all the design choices encouraging social play and interaction, grouping patterns are not uniform throughout various stages of the game. They conclude that while the complex endgame phase from a group-play perspective is social, the game as a whole may not be. At the same time, they highlight that solo players in massively multiplayer environments are still part of the social fabric: they are always surrounded by others even when not playing with them.

In fact, sociability is much more complex than grouping patterns may indicate. Beyond direct support and companionship, other players serve as an audience for various presentations of selves (often linked with status displays of gaming capital and competence), social presence, and spectacle. While the distinction between players and audiences are much clearer in first-person shooter (FPS) games, it is nonetheless part of MMO games as well. In FPS environments, there is a constant back-and-forth movement between the roles of player and audience, or performer and critic, allowing players to negotiate the appropriate forms of interaction (Ducheneaut, 2010).

These accepted modes of interactions are not only game title specific, but different playing modes, servers, factions, maps, clans, and guilds form their own local cultures, called idiocultures. Because games attract diverse audiences (when considered by geographic location, age, social class, gender, race, ethnicity, etc.) success is measured by a player's ability to integrate into a local idioculture. To become part of a community of play (Pearce, 2009), players have to learn and master various gaming and technological skills while maintaining desirable social selves. Gaining visibility and reputation is an active, although not necessarily conscious, social process. Both individual and organizational (guild) success is predicated upon reputation and status management, and the development of a sense of trust and responsibility (Taylor, 2006).

Bonnie Nardi (2010) observed that performative mastery is fundamental in building reputational capital. Performance is often measured and reported through various gaming mods. Wright, Boria, and Breidenbach's work (2002) demonstrates that status is further established through virtual talk and behavior during down-time, in between games, or when one is forced into the role of spectator. Mastering this local gamer language, which borrows freely from popular and youth culture representation, is an admission requirement into the broader social network.

The management of reputation is a key component in becoming known as a skilled or knowledgeable player or an amicable playmate. On the group level, reputation is a key component of the creation of social hierarchies. These hierarchies are often anchored in measurable game achievements and goals, such as player versus player rankings, kill ratios, or raid progression. At the same time, role-playing communities often disregard these official matrices and establish their own.

Trust and responsibility is the foundation of group play, although the reliance on others provides a constant challenge to find adequate playing partners and recruit new members to fill gaming groups. While ethnographic accounts of play communities often focus on the persistence of social groups, especially in MMO games, various social accounting metrics remind us that guilds are indeed extremely fragile and group cohesion and longevity is often overestimated.

Ducheneaut, Yee, Nickell, and Moore (2007) believe that this fragility is due to various social factors and design flaws: leadership style, burn-out due to the repetitive nature of games, guild drama, and social pressures to participate. Pearce believes that persistent social formations and guilds resemble complex, decentralized, emergent social institutions and their rise and fall cannot be predicted by their underlying structures or set of rules, nor by individual behavior of stakeholders (2009). At the same time, the data presented by Ducheneaut and his colleagues convincingly demonstrate that guilds are more likely to survive if they attract large number of players, maintain a balanced class composition, and are organized around a dense internal social network.

Conclusion

There has been an explosion of academic interest in video games and other virtual worlds during the last decade. Much of the social scientific work, with some notable exceptions, is focused on games as “cultures.” As long as video games and the social dynamics of virtual realms are bracketed off from the “real” world, video games will remain marginalized for the field of sociology. Yet, given the importance of video games in modern society and the connection between these worlds of make-believe and consumer capitalism, it is important to expand the sociological lines of inquiry.

This essay offered a brief introduction to a sociological, organizational, and group perspective on video games. The sociological reframing of video game play allows researchers to fully embrace and discover the dialectic of contemporary video game play. This dialectic centers on predominantly for-profit enterprises developing titles by borrowing, transplanting, and transforming dominant ideologies, representations, and stereotypes. Packaged products are marketed under the rules of the transnational capitalist system. Still, the end-user is never a passive consumer of media products and the ideologies contained within them. Agentic users form communities of meaning, create lively idiocultures, and take ownership of virtual realms by challenging operators and publishers.

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Part VII

PHILOSOPHICAL ASPECTS

51

COGNITION

Andreas Gregersen

Cognition is that which is studied scientifically by cognitive science, defined succinctly as “the interdisciplinary study of mind and intelligence” (Thagard, 2012). The word “interdisciplinary” hints at the plausible assertion that, instead of a single cognitive science, there are in fact a range of cognitive sciences (emphasis on the plural). The title of the *MIT Encyclopedia of the Cognitive Sciences (MITECS)* signals this, and it refers to “the various disciplines that contribute to the cognitive sciences, including psychology, neuroscience, linguistics, philosophy, anthropology and the social sciences more generally, evolutionary biology, education, computer science, artificial intelligence, and ethology” (Wilson & Keil, 1999, p. xiii). The word “contribute” is used because the disciplines mentioned are not at the outset defined as cognitive disciplines. Rather, the idea is that work conducted within all the mentioned disciplines can contribute to the overall endeavor of a science of cognition. MITECS uses the terms “cognitive science approaches” to designate such work, and concrete examples can be found in the way the adjective “cognitive” is used as a prefix, as in cognitive psychology, cognitive neuroscience, cognitive linguistics, cognitive sociology, and so on. Beyond a preoccupation with questions of mind and intelligence, it might not be entirely clear what the criteria are for a disciplinary approach to qualify as cognitive, but we will proceed by introducing some fundamental topics and discussions in cognitive science. We will then move on to some concrete instances of work that identifies itself as cognitivist and relate this body of work to video games on both general and more specific levels.

Central Issues and Recent Developments

The field of cognitive science is self-consciously pluralist; many different approaches to the same issues exist within the field. It would be folly to try to summarize all the main topics here, but we can introduce a bit of common ground (for a general introduction to cognitive science the reader is referred to *MITECS* and the large number of textbooks available, such as Eysenck and Keane (2010) and E. E. Smith and Kosslyn (2007)).

Cognitive psychology is a central discipline, and most textbooks devote chapters to perception, attention, memory, language, emotions, problem-solving, and action. These processes are conceptualized as mental representations and the operations performed on them. One very prominent concept used to describe mental representations is that of schemas, which can be seen as the building blocks of mental representations. Schemas should be understood hierarchically, and range from fundamental image schemas (such as containers and paths) to larger gestalts that organize such comparatively simpler schemas into complex schematic structures such as compound objects (a chair), events (going to a restaurant), spatial layouts (a kitchen), scripts (ordering a meal, eating it, and paying for it), and stories ("Listen, something funny happened on the way to the restaurant … first … then … and finally …") (Mandler, 1984; Schank & Abelson, 1977).

In the earliest phases of cognitive science, during the 1950s and 1960s, cognition was seen as a rather disembodied affair. Although no one seriously doubted that the brain was responsible for the instantiation of the mind, cognitive psychology was content with treating the mind on the basis of an abstract model of a computer (see Neisser, 1967). As such, cognitive science was intricately tied to the conceptualization and later invention, development, and actual production of computer technologies. One way to see historical developments within cognitive science is that this early disembodied computational model has been challenged, if not replaced, in several ways. An overarching issue has been that of defining the mind and intelligence and its place in a material world—what is the mind, where is it, and how should it be studied?

Some of the central discussions have targeted the relationships between the mind and the brain, the mind and the body, and the mind and its environment. Neuroscience has seen an explosive development over the last 20 years, and has powerfully influenced psychology in general and cognitive psychology in particular, making them pay more attention to the hardware of the mind (or wetware, as it is sometimes called). Not everyone, however, agrees with the bon mot that "the mind is what the brain does"—the issue here is one of possible reductions to brain states, an issue that is hotly debated especially in the philosophical cognitive community. Another issue which has become more prevalent is that of *embodiment*. Here, the criticism has been that cognitive science has largely ignored the role played by the body in cognition. One result has been an increasing emphasis on the significance of embodiment for mental representations and their deployment in language and metaphor, as seen in the seminal work of Lakoff and Johnson (1980) and subsequent work (see Gibbs, 2006). Related, but also importantly different, lines of criticism has been offered by ecological psychology (Gibson, 1979; Neisser, 1976), where minds are seen as integrated in active organisms, and schemas both structure cognitive activity and are updated and modified by this activity in a continuous loop or "the perceptual cycle." Contemporary phenomenology (Gallagher, 2005; Gallagher & Zahavi, 2008) and philosophy inspired by biology and robotics (Clark, 1997) have argued along similar, but again not identical, lines that mind cannot be separated from the "lived body" and/or the biological organism, and which is more often than not seen as fundamentally intersubjective, and socially constituted. A third criticism is that offered by *distributed cognition*, where cognitive operations are seen as something that belongs not just inside individual heads but rather to distributed systems (Hutchins, 1995). This could be seen as a specific take on a more general idea, namely that mind is always *embedded* in an environment (Haugeland, 1998), both material and social—individuals will use their environment, for instance to offload complex tasks to technology or fellow cognizers. The last two lines of criticism, those of embodiment and embedding, come together to inform the position of *situated cognition*, which has gained traction within cognitive science (although it is arguably more popular within philosophy than empirical psychology). As described in a recent handbook, the situated position argues that mind is fundamentally embodied, embedded, and situated (Robbins & Aydede, 2009). The position also entails that mind is to some extent *extended* beyond the organism (Clark & Chalmers, 1998), but this is a question which is still hotly debated (see select chapters in Robbins & Aydede (2009) and Clark (2010)).

A moderate version of the situated cognition position should be attractive to scholars of video games. The position directs our attention toward not just cognitive operations “inside the head” but also toward embodied, embedded, and situated individuals and their interactions with their material and technological environment. Video games are played by active, embodied individuals, and many of them involve the specifics of the human body in complex ways—think ergonomics and controllers, for instance. Video games are also complex technologies that utilize computation, a process that has been seen as a central component in human cognition—computers are arguably the dominant tool used in cognitive offloading in contemporary societies. Related to this, video game use is situated in an environment that includes complex technologies as well as other humans, with whom players can communicate and interact.

The Mind and Its Contexts, Explicitly and Implicitly

In accordance with situated cognition, we will assume that a cognitive science approach can be applied fruitfully not just to the mind narrowly understood, but also to the cognitive environment. This would include the popular and mass arts, such as novels, film, and video games, where we find complex objects that are designed explicitly to capture and sustain attention and interest and evoke emotions. Cognitive theory has already made considerable inroads here, and sub-disciplines exist that use the prefix cognitive to denote their particular approaches, such as cognitive narratology and cognitive film theory (see Herman, 2002, 2003; and Bordwell, 1985). Since film has been and is still predominantly a narrative medium, there are considerable theoretical overlaps between these two approaches. Sternberg, in an article on cognitive narratology and its relationship with cognitive science in general, writes that for cognitivism in its broadest formulation “the disciplinary object of study intersects with everything in human experience” (Sternberg, 2003, p. 304). This is a very large garden for cognitive theory to cultivate, and situated cognition has certainly not made it smaller. One problem when applying cognitive theory to the arts is noted by Sternberg, namely the tendency for scholars to write within their own disciplinary circles—perhaps to avoid getting lost in the underbrush of the garden cum wilderness of human experience *in toto*. A main charge against cognitivism is thus the danger of “atomism”—several isolated approaches all dealing with much the same thing in relative ignorance of each other—but overgeneralization is another one. Hence, even if cognitivism can be applied to all of human experience, one cannot just assume that cognitivism on its own will suffice. In other words, a cognitive theory of video games will need to pay attention to both cognition and video games and these theories need to be properly integrated, lest we press forth with ill-fitted *prêt-à-porter* theories where finely tailored ones are necessary.

As a final point in relation to the potential and actual breadth of cognitivism, one might distinguish between explicit and espoused cognitivism on the one hand and implicit cognitivism on the other hand, where the latter is compatible with cognitivism without claiming so explicitly. Primarily due to brevity but also clarity of argument, this essay will deal almost exclusively with explicit cognitivism, but two things should be noted. First, scholarship on video games may exhibit a mix of explicit and implicit cognitivism. Second, even if the topics may not appear to be the province of cognitive science, other essays in this *Companion* describe and discuss phenomena that have been analyzed within cognitive approaches, for instance conventions and culture (Zerubavel, 1997).

Cognitive Universals: Expectations and Hypotheses

A key tenet of cognitive approaches within narrative theory is the interplay between narrative operations and cognitive operations—narratives are designed for human minds. Sternberg (2003) argues that this lineage can be traced all the way back to Aristotle's *Poetics*. This formal-functionalist approach (see also Bordwell, 1985, 2004, 2008) holds that a primary function of a given work's narrative form is to help—or creatively hinder and play around with—the construction or reconstruction of narrative content by readers and viewers. In order to sidestep a reasonable complaint from ludologically-inclined readers, it is necessary to draw very general points from the formal/functional cognitivist position, that is, points general enough to apply to other things than stories and the tellings thereof. One of these is the idea that narratives are fundamentally constructed to manipulate the expectations of audiences over time. This conceptualization of processes involving expectations and the forming of specific hypotheses (Bordwell, 1985; Sternberg, 1978, 2003) is readily applicable to video game play. Players have expectations of games and their design structures and these expectations structure the ongoing construction and testing of hypotheses in a loop of interaction. This interaction between game and player will typically be based on players' recognition of game genres and conventions associated with these (see Chapter 10, this volume, on conventions, and for a cognitive view on genre, see Frow, 2006).

To give more structure to this interplay between work and mind, Sternberg has proposed three universal cognitive dynamics that are characteristic of the way narratives play with expectations of readers; namely suspense, curiosity, and surprise (Sternberg, 2001, 2003). These cover situations where the reader of narrative is oriented toward the future and the past in different ways, as prospection, retrospection, and recognition, respectively. The latter terms are taken from phenomenology, and it should be pointed out that they are always fused as a precondition for temporal experience—we are always comprehending the now of the present in terms of both its past and future. The terms are meant to emphasize one aspect of experience over the others, and, with due diligence, this triad is readily applicable to gameplay understood as a cognitive and experiential process unfolding in time.

Starting with suspense, Sternberg writes that "[s]uspense arises from rival scenarios about the future" (2003, p. 327). We can see this as a predominant cognitive orientation toward specific and possibly mutually exclusive possible future scenarios arising from the interplay between game design, player actions, and strategies. Players can be invited to form quite specific hypotheses about the structure of the game and its progress on many levels—most obviously with regards to plot structure and possibilities of failure and success of player actions tied to specific goals. Curiosity is related to, but more general than, suspense: it allows players to progress with less constrained and less specific expectations, but constrained nonetheless—predominantly by local game conventions and more global genre conventions. Although players will be working on the basis of hypotheses and expectations, they might simply be interested in ascertaining what comes next in terms of mechanics, quests, goals, and plot development. (Here, I am departing from Sternberg's usage of curiosity, since he uses it more narrowly to describe the distinctly retrospective operations used in many narratives, where key information must be retrospectively fitted. Narrative games may employ such retrospection to great effect, as seen in Bioware's line of role playing-games as well as *System Shock II*, 1999 and *BioShock*, 2007.) Players will be more oriented toward collecting information and piecing together an understanding in hindsight—harvesting data for better hypotheses. Surprise is, of course, when the structure of the work confounds our specific expectations by introducing some element that has not been hinted at up to that point—a sudden introduction of new mechanics, an explosion blowing up the escape submarine, or a whole castle turned upside down to be traversed again.

The strength of this tripartite framework is its broad applicability. Since it targets cognitive phenomenology in general, it covers several levels of analysis, and potentially all of them; in Sternberg's own words, "the three master effects/interests/dynamics cut across all generic variables" (2003, p. 328). It is general enough to cover a multitude of instances of how game design can be designed for cognitive operations, and it ties in directly with the previously mentioned work on conventions and genre. This broad conceptualization is, however, also a clear weakness: it does not deliver any kind of formal framework to analyze game design itself. In other words, it identifies protension and retrospection as important cognitive orientations of players, but it does not describe what these scenarios about the future might be about or what kinds of information might be involved in retrospection. The framework needs to be fused to categories relevant for analysis of game design and game structure, for instance core mechanics, challenges, boss fights, progression structures, level layouts, or quest arcs and rewards (the reader is referred to the existing literature as well as the requisite essays in this *Companion* on the formal (Part II), cultural (Part V), and sociological (Part VI) aspects of games).

Another weakness is that some important dynamics seem to fall outside of the triad suspense/curiosity/surprise, especially once we acknowledge that these might be determined by both game structure and by players' agency—an open question for most media research. The first dynamic is that players do not just form hypotheses and let a system of narration confirm or disconfirm them as the narration progresses—players test hypotheses by performing intentional actions. As such, it is through interaction with the game system that hypotheses are formed, tested, and revised in a continuous, looped process of gameplay (see Arsenault & Perron, 2008), where players decide how and when to test their hypotheses, even if games obviously can and do manipulate players to form specific hypotheses and hint at ways to test them. Second, playfulness is not addressed (see chapters in Part III of this *Companion*). In more psychological terms, the mode of action identified by Apter (1982, 1991) and others as paratelic (that is, non-goal-related playful behavior-for-its-own-sake) is missing here. One aspect of the playful character of some gameplay sessions should nonetheless be captured fairly well by player curiosity, namely the act of merely "playing around," exploring whatever secrets the game system might reveal at several levels of analysis. Finally, there is the potentially repetitive nature of gameplay on several levels, from key mechanics of player actions to the replaying of certain levels and whole games. Many game sessions are performed not for the sake of new information but as repetitions of progressively skillful and refined playthroughs—unfocused curiosity and surprise will give way to a distinct and refined protensional attitude. The idea of flow

(Csikszentmihalyi, 1990) seems related to this last kind of process. To summarize: When combined with a suitable game analysis framework, these cognitive universals yield a broadly powerful, but somewhat crude, tool to ascertain some fundamental aspects of the cognitive interplay between game and player.

Cognitive Specifics: Aspects of Video Game Structure and Their Functions

In addition to the very general perspective laid out with respect to the cognitive universals suspense/curiosity/surprise, aspects of cognitive narratology can be useful in its specific form as narratology. This framework can thus be applied directly to games that have narrative aspirations, with the requisite caveats and substantiations: It is obvious, for instance, that many video games do use narrative strategies, but these depend heavily upon the interplay between game and player as information is distributed over time. Cognitive film theory has been closely allied to cognitive narratology, but it has also dealt with issues more specific to film as an audiovisual medium. Cognitive film theory is useful for understanding audiovisual representation in games (King & Krzywinska, 2006), and can thus be used to analyze cut-scene structure (Klevjer's (2002) study of cut-scenes is not explicitly cognitive, and might not even be implicitly so, but is not incompatible either). Also, cut-scenes may carry narrative substructures such as dialogue—one study points out that film theory has not paid very much attention to dialogue even on its home turf (Smith, 2002), so this still seems a bit of a blind spot. Dialogue is a key component of many games, but it can obviously serve different functions than in film—it lays out tracks for suspense/curiosity/surprise, but often these tracks split into quest structures and/or arcs of progression, which may yield mutually exclusive outcomes depending upon player agency (for an analysis of how this can tie in with narrative and character engagement, see Jørgensen, 2010).

While the first wave of cognitive film theory was mostly interested in narrative structure (Bordwell, 1985), a second wave incorporated work on emotions (see Tan, 1996; Grodal, 1997; Plantinga & Smith, 1999; and Smith, 2003). Cognitive theories of emotion see emotions as tied to cognitive appraisal of situations relevant for goal-related actions. This means that the structure of emotions will necessarily differ when dealing with interactive works such as games—intentional actions are performed, not just perceived and interpreted. This approach within cognitive film theory has been employed to analyze the difference between modes of spectatorship and the resulting emotions (Frome, 2006; Perron, 2003). Further, narrative structures and their connections to rudimentary actions and emotions across film and games have been investigated (Grodal, 2003) and film theory and genre theory has informed work on horror games (Perron, 2005, 2009, 2012). Järvinen's (2008) work on games and emotions has bypassed the path of cognitive film theory, but has applied similar cognitively-oriented theories of emotions to game structure, and work originating directly in emotional psychology (such as Tan, 1996) has been applied to film and games. In addition, Tan's proposal for an overreaching emotion of interest has direct relevance for the previous discussion of cognitive universals (especially curiosity). Core cognition (a conceptualization of universal, and possibly innate, features of the mind originating in developmental psychology), has been used to examine prominent design patterns in game genres such as platform and action games (Gregersen, forthcoming). The concepts of embodiment and embodied agency have informed work on the relationship between players and avatars, both in terms of deep commonalities in embodied interaction as well as differences, the latter of which can be tied to genre by way of generic interaction modes (Gregersen, 2011; Gregersen & Grodal, 2008). Klevjer (2007) employs cognitive film theory and phenomenology to deliver a detailed investigation of the avatar and its functionality in games. Finally, schema theory has also been proposed as an overall approach to games and cognition, where game-specific schemas and scripts are proposed in a framework that cuts across perception, emotion, and actions (Lindley & Sennersten, 2006, 2008).

In addition to this work, which is generally formal/functionalist in nature, more empirical and experimental approaches to video games exist. These studies are conducted as part of media psychology and presence research that investigates motivations and reactions of viewers—or players, when the stimulus condition involves games. This work covers a range of specific topics across action, motivation, and emotion (for examples see (Nacke & Lindley, 2009; Nacke, 2009; Ravaja, Saari, Salminen, Laarni, & Kallinen, 2006; Vorderer & Bryant, 2006; Klimmt, Hefner, & Vorderer, 2009). A related approach has been to investigate the possible positive effects of video game play, with a focus on traditional subjects of cognitive and perceptual psychology such as hand–eye coordination and spatial reasoning tasks (Green & Bavelier, 2006), a tradition that has followed video games for quite a while (Greenfield, 1984). Finally, one of the dominant modes of investigation within media psychology has been the inclusion of video games into the ongoing research on media violence that is based mostly on experiments or survey data. While some of this work is explicitly cognitivist, it will not be dealt with here, not least because the amount of work is staggering and the conclusions and policy implications are somewhat controversial outside of the researchers’ own circles; the reader is referred to (Millwood Hargrave & Livingstone, 2009) for a recent and sober review of the overall issues from a sociological viewpoint.

Coda: Cognition and Computers—Not a Casual Acquaintance

As already mentioned, cognitive science has predominantly used a very specific model to understand the mind, namely the computer. Although this model has been challenged, as described above, both the digital computer and processes of computation have played and still play central roles in cognitive science approaches within philosophy and psychology as well as in artificial intelligence research. Both our contemporary sciences, including those of the mind, and our everyday intuitions about the mind, have arguably been tied directly to the development of computers—and thus, to some extent, to video games. Apart from the massive diffusion of video game technology in society, development of computers has always had ties to games: The history of artificial intelligence research overlaps considerably not just with computer programming but with *computer game* programming. An important poster child and yardstick for machine intelligence has been the various (super)computers programmed to play chess and other games (chess has even been referred to as having played a similar role for (early) artificial intelligence as the fruit fly for modern genetics (Schaeffer & van den Herik, 2002)). Differences between artificial intelligence as a research program and the game design sub-discipline notwithstanding, several kinds of artificial intelligence programming (path-finding, decision models, etc.) find practical use in the design structure of many video games (see Chapter 11 in this *Companion*). Early and foundational military uses of computational simulation were those of mechanical physics, ballistics but also rational behavior in systems designed to simulate armed conflicts (Avedon & Sutton-Smith, 1971); again, and not withstanding their many differences, there are clear affinities between this and the genre of strategy war gaming. These connections are certainly worth exploring further, but they have not been the focus here. Rather, this essay has outlined both general and specific applications of cognitive theory within the field of video game studies. Given the range of cognitivism, especially in its situated version, and the diffusion of game technologies into society, many fruitful avenues for cognitive video game research seem viable. The challenges of both atomism and overly general applications obviously remain.

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52

EMERGENCE

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Emergence describes the phenomenon of systems that consist of relative simple, interacting parts, creating rich, unforeseen patterns of behavior after being set into motion. Within the science of complexity that studies emergent systems, games are a popular and intuitive illustration. Classic board games such as chess, checkers, or Go create nearly endless variety in possible game states; all the possible configurations of pieces on the board that are the result of playing the game from its starting conditions. Series of successive moves create patterns of behavior that are the building blocks for strategic play. Anyone familiar with these games will analyze a game state for patterns that can be understood as lures, traps, defensive positions, offensive potential, and so on. To play them successfully, players must be able to read the game state in this way. This is both the beauty and the difficulty of mastering an emergent game, and requires considerable experience with playing the game. At the same time, for emergent games, "the whole is more than the sum of its parts." The sheer number of possible game states and the endless variety in subtle gameplay patterns stands in stark contrast with the number of rules that define these games: all the rules of either chess, checkers, or Go can easily be printed on a single sheet of paper. These classic games are the epitome of elegance and effectiveness in complex systems designed for emergence.

Video games share this aptitude for emergence with board games. Although video games offer new opportunities to include much more content in the game, the richest games with the highest replay value tend to rely on emergent techniques to create unending variation in their gameplay (Juul, 2002). Players often enjoy the freedom that emergence brings in games, even if that freedom leads to unforeseen player tactics such as rocket-jumping in *Quake* (id Software, 1996) or grenade climbing in *Deus Ex* (Ion Storm, 2000). Video game designers do well to embrace emergence as a design philosophy and design goal (Smith, 2001).

For those that study and design games, emergence is a serious challenge. By its very nature, emergence in games can only be appreciated after the game has been built and set into motion. Simply looking at rules reveals surprisingly little about the quality of the gameplay. Because of this, designing a classic board game with enjoyable, emergent gameplay is probably one of the hardest design tasks anyone can set for him or herself, one that sometimes can seem to involve more luck than skill, in order to come with just the right mixture of rules. A common design exercise given to new students of game design is to take a simple, published board game and change its rules (for example, see the *Up the River* (1988) exercise described in Fullerton, 2008). More often than not, this exercise illustrates how fragile the balance of a game's components really is. It is incredibly easy to break a functional game, while it is incredibly difficult to improve one. Starting from a poorly-designed and badly-balanced game does not make it much easier. Even in that case, most rule changes will not improve the game. It takes skill, experience, and a lot of hard work to find exactly those changes that move the game's dynamic behavior in the desired direction.

Effectively designing games of emergence requires specialized knowledge and an open attitude that embraces the inherent uncertainty of the venture. Likewise, the study of emergent games requires similar knowledge, and a true appreciation of the open-ended nature of game systems is paramount. This essay explores the knowledge required to fully appreciate games of emergence. It studies the philosophy behind their design, and seeks to resolve the paradox of deliberately engineered, emergent gameplay.

Complex Systems

From the science of complexity, we know two important things: (1) emergence exists somewhere on the border of chaos and order, and (2) a number of structural features of the complex system give rise to dynamic, emergent behavior (for example, the number of parts, the number of connections between the parts, and the presence of feedback loops within the system).

The behaviors of systems can be classified into four rough categories: they can be ordered, periodic, emergent, or chaotic (Holland, 1998; Salen and Zimmerman, 2004). The boundaries between these four categories are fuzzy and together they create a something of gradual scale with ordered behavior on one end and chaotic behavior on the other. Examples of all types of behavior can be found in games. Scripted level design is ordered behavior; the players' movement around the Monopoly (Parker Brothers, 1934) board creates a periodic system. The distinct gameplay phases in a game of *Civilization* (MicroProse, 1991) (early expansion, consolidation, direct conflict, overseas colonization, space race, and so on) are the result of the game system's emergent behavior, while the random numbers generated by rolling dice are the result of a chaotic interplay of forces as the dice bounce on the table. Games typically employ mechanisms that push the system's overall behavior toward one of the two ends: random factors typically push a game toward chaotic behavior, while a predesigned progression of fixed levels pushes a game toward more ordered behavior. As emergence is to be found between the two extremes, the balance between chaotic and ordered mechanisms is vital. Individual games each have their own balance: some lean more toward predictable progression, while others are more emergent. The categories of games of progression and games of emergence (Juul, 2002, 2005) describe both ends of these gradual scales. Many games, however, combine elements of both categories. For example, the physics simulation in *Half-Life* (Valve, 1998) creates highly emergent gameplay, while its level structure and story creates a linear progression through the game.

Games do not need to rely only on random number generators to create emergent gameplay; a game can be made to have unforeseen outcomes without resorting to random mechanisms at all. For example, chess, checkers, and Go do not use dice, yet they are games that display highly emergent behavior. If a system is sufficiently complex, that is, if it consists of enough interconnected parts, it can already display sufficiently emergent behavior. Studies by the mathematician Stephan Wolfram reveal that systems that consist of parts that are all easily described in isolation as simple state machines, create emergent behavior when the parts are connected so as to allow long-range communication and maintain a sufficient level of activity (Wolfram, 2002). In this case, "level of activity" means that individual parts must change its state frequently, and long-range communication means that these state changes trigger a cascade of subsequent state changes that propagate through the system over long distances or over long periods of time. For these effects to occur, it is not the number of parts (nor the number of states they can be in), but the number of connections between the parts that is the most important factor: emergent behavior is more likely to occur in systems with a high number of connections.

An important structural feature that has been identified by scientists investigating complex systems and game designers alike are feedback loops in the (game) system (LeBlanc, 1999; Fromm, 2005; Adams and Dormans, 2012). A feedback loop is created when activity created by the state change of a part of the system is propagated through the system in such way that it ultimately feeds back to the original part to create new state changes with more activity as a result. Feedback loops are common in games. For example, most real-time strategy games involve some sort of resource harvesting. In these cases, resources can be used to buy or build new worker units that in turn produce more resources. This creates a positive feedback loop: an effect that strengthens itself and quickly spirals out of control as more resources lead to more workers, which in turn lead to more resources, and so on. Negative feedback loops, where the feedback effects act against the initial change that triggered them, are also frequent. For example, in *Civilization*, growing cities require more and more food and money to keep the citizens alive and content. In this case, negative feedback creates a type of friction on a city's growth that causes it to stabilize on a particular size based on the available food, technology, and gameplay choices made by the player. Emergent games often delicately balance multiple positive and negative feedback loops interacting within its mechanics.

Creating interconnected feedback mechanisms is an important aspect of the design of a game's core mechanics (Adams and Dormans, 2012), which requires a detailed understanding of the game's structural features and mechanics. However, the real goal is to create a compelling gameplay experience. To this end, a designer must also keep an eye on the larger patterns in the game's emergent behavior. As was already mentioned, emergent games typically go through a number of distinct gameplay phases. These phases are the result of the game mechanics' complex interactions, but frequently they also depend on more ordered and predesigned aspects such as restrictions imposed by the level design or pre-scripted narrative triggers. For instance, on the one hand, in a real-time strategy game, close proximity to vital resources and little hostile activity will likely to lead to sessions where players can build and consolidate fairly easily before starting to explore the map and attack the enemy. On the other hand, a level with scattered resources and more active foes will create sessions where building and consolidation phases are much shorter and will alternate with offensive and exploration phases more frequently. Game mechanics, level design, and story-telling are the main materials with which the game designer composes the game's overall pattern of behavior.

A relatively simple example of such a "composition" of two phases can be found in *Tetris* (Pajitnov, 1984). Initially, the player has plenty of time to place falling tetrominoes efficiently and clear lines fast enough to prevent the play space from getting cluttered with blocks. However, a positive feedback mechanism drives the game to its conclusion: as tetrominoes block up the game place the player has less and less time to place the tetrominoes efficiently. This makes the player's task more and more difficult. As s/he clears more and more lines, the game speeds up. Eventually the game goes too fast and the positive feedback quickly spins out of control, ending the game mercifully quickly. It might be argued that there is also a third phase in between these two phases, where the player struggles to keep up with the game but is not quite losing yet. During this time, the player might get lucky and receive the particular tetrominoes that are needed to clear lines in quick succession. Sometimes the player, with a combination of skill and extra effort, might even push the game back to the initial phase. *Tetris* always progresses through these two (or three) gameplay phases as the simple and entirely ordered mechanism that causes the game to speed up will always eventually push the game into the last, losing phase.

In the case of *Tetris*, the progression through the different phases is always the same (dismissing cases where players are able to push the game back from a losing state to a stable state, either by luck, effort, or by deliberately performing poorly initially). In games where the mechanisms that cause shifts between phases are more complex, the progression of phases will take on different shapes. For example, the mechanisms that cause shifts in the phases of *Civilization* depend much more on the decisions of individual player and his/her AI opponents. At the same time, the dramatic shifts between phases of expansion and conflict do contribute greatly to the gameplay experience. In order to understand and harness emergent gameplay, game designers and game analysts alike should study the way different structural aspects of game mechanics create gameplay phases, and what mechanisms can be used to create dramatic shifts between gameplay phases at exactly the right moment. Whereas in other (non-emergent) media, designers have complete control over the artifacts they create, emergent games require a different approach altogether.

Embracing Emergence

To fully appreciate emergence in games, designers and analysts need to embrace the open-endedness and uncertainty that it brings; in order to capitalize on the opportunities emergent games offer, designers and analysts need to adopt an approach to design that breaks away from the classic authorial perspective. Games of emergence are not media expressions in the same way books, films, or paintings are. They are machines that produce narrative, cinematic, or picturesque expressions. To paraphrase Espen Aarseth: they are a form of "ergodic" literature, which means that nontrivial effort is required by players in order to traverse the game and to produce their own unique experiences (Aarseth, 1997). This means that the "author" of a game does not have full control over what experiences are generated by the game; this responsibility is shared with the player and the game itself. Although it might be argued that the author produces the game and therefore has some level of control over the events it might generate (Murray, 1991), in the case of emergent games, the number of possible events is far too large to be controlled in a strict sense. Unexpected and unforeseen events are always possible; in fact, they are to be expected. In the end, the author cannot predict all possible combinations and variations produced by players and the game system.

The distinction between "textons" and "scriptons" made by Espen Aarseth (1997) provides a useful starting to explore this issue in more detail. Textons are the pieces of text included in the game (the models, scripted dialog fragments, cut-scenes, designed levels, and so on), while the scriptons are the expressions that are the result of playing. Obviously, the number of possible combinations of textons leads to a vast number of scriptons. For instance, there are only seven different tetrominoes in *Tetris*, yet the number of different ways they can be placed in the game space is far beyond count. The game designer has full control over textons but far less over the resulting scriptons. This does not mean any combination of textons is a scripton that could be produced by the system. For example, the game of chess has all the pieces that could represent the actors of a medieval romance (knights, kings, queens, bishops, castles, and two different colors to denote two different families), but the rules of the game only allow them to be combined in such way that they always form an abstract representation of battle. Only looking at textons and scriptons does not give a full account of what type of messages can emerge from a game.

The mechanics of a game define what *operations* are possible to combine different textons into scriptons. It is through these operations that the designer does execute some indirect control over the meaningful behavior of the system as whole. It might be argued that for certain games, and games of emergence in particular, these operations on elements of the system are more important than the textons. To use Ian Bogost's words: games are all about the "unit operations" within the system (2006), or to quote Brenda Brathwaite: "the mechanic is the message" (2009).

One of the most intriguing aspects of games of emergence is how these games can become so much more than their designers originally intended. Games of emergence can act as catalysts to explore new ideas, and are increasingly used to do so. It is because of this that Harvey Smith (2001) is enthusiastic about grenade climbing in *Deus Ex*. Grenade climbing is strategy that leverages the mechanics of the game's proximity mines. Players can stick these mines onto walls, where they arm themselves in five seconds. However, due to the implementation of the game's physics, players are able to jump on top of these mines, allowing them to place another proximity mine a little higher, to create a ladder of some sort. This allowed players to take shortcuts the designers never intended and reach locations in the game that would otherwise be unreachable. On the one hand, it might seem that the players simply came up with a gameplay strategy the game designers did not foresee, but on the other hand, it might be said that the consistent, yet emergent behavior of the game inspired players to use all their creativity and explore ideas outside the box. Management simulation games and policymaking games could benefit tremendously from this effect; and it also means that the game designer does not have to know all the answers to a problem beforehand. A game can be a vehicle to explore a problem and produce answers in an efficient and safe way. In fact, the success of the nineteenth-century simulation war game Kriegsspiel (Von Reisswitz, 1824) largely lies in the way it prepared German officers to the eventualities of the upcoming battle: they would have run through several scenarios before a single gun was fired (Gray, 2008). The game did not contain any of the answers to the tactical challenge offered by the battle, but it offered players a machine with which they could find those answers themselves.

However, most entertainment games seem to refrain from tapping into this vast potential (as do most "serious" games). For example, in the case of games with procedurally-generated content, arguably the most emergent games of all, there is a huge variety of scriptons based on very few textons and some very sophisticated procedure, yet gameplay seems to vary far less. Classic examples of this type game are the experimental and independent games *Rogue*

(Artificial Intelligence Design, 1983) and *Dwarf Fortress* (Adams, 2006), but also triple-A games such as *Diablo* (Blizzard Entertainment, 1996) make use of these techniques. In these cases, the gap between the textons (individual dungeon tiles, and creatures) and the scriptons (a dungeon-crawling adventure) is huge and bridged by an intermediate form (generated dungeons and quests). However, at the same time, while the details of dungeons and quests that are generated might vary indefinitely in these games, their type does not vary as much. As it becomes clear from Ernest Adams's satirical "Letter from a Dungeon" (2000), they all grow alike very quickly. In other words, a system's ability to generate an infinite number of scriptons does not necessarily lead to an equal number of meaningful interpretations or significant sessions of play. This effect can be found in other emergent games, too: *Civilization* generates a huge number of possible game states and supports a large number of different strategies, yet an ideological interpretation of the game reveals that its message is always the same and supports a Western, technocratic world view (Kline et al., 2003, Galloway 2006). Even games that claim to offer a scale of moral choices, such as *Black & White* (Lionhead Studios, 2001), *Fable* (Big Blue Box Studios and Lionhead Studios, 2004), *BioShock* (Irrational Games, 2007), or *inFamous* (Sucker Punch Productions, 2009), almost, without exception, resort to ridiculous stereotypes of what it means to be good or evil, as was eloquently pointed out in the Zero Punctuation review of *inFamous* (Croshaw, 2009). These games reveal nothing about good or evil that the designers have not put in beforehand. All these games successfully create an open world for the player to explore, but the openness of the exploration and the action mechanics seems to be in stark contrast with the less emergent design of the games' narrative structures. On the level of physics and action mechanics, they clearly fall into Jesper Juul's category of games of emergence on one level, while on the level of narrative they are games of progression.

Conclusion

The question remains whether emergent games often are restricted in the number of significant gameplay results because designers subconsciously cling to a high level of control out of habit (after all, for a long time our culture celebrated, and still celebrates, the individual, creative genius of the creator of any form of art), or because they lack experience to create games that are truly emergent and that can be used to explore a vast array of possible significant strategies? It is safe to say that complex, emergent systems as a media form are relatively unexplored. Although games have been around for a long time, the ubiquitous presence and procedural power of video games is far more recent. Likewise, the science of complexity is a young field and most of its results have still to find their way into the common parlance and knowledge of game designers and analysts. Yet, as long as both are willing to embrace the designer's new role of indirect composer of gameplay phases (instead of direct author of media texts) and study the structures of games that contribute to the emergence of stable gameplay phases as well as contribute to dramatic shifts from phase to phase, the future of emergent games is bright, no matter how much research and experimentation there is left to do.

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53
FICTION
Grant Tavinor

Video Games and Fiction

It is plausible that video games contain elements of fiction. *Red Dead Redemption* (Rockstar San Diego, 2010) depicts the fiction of a man named John Marston, his search for the members of his old criminal gang, and his death at the hands of federal agents. Marston, the world in which he lives, and the events that take place around him are the type of depictions that would find a natural place in other fictive media such as cinema. But significantly, the *gameplay* of *Red Dead Redemption* also partakes in this fiction: the player spends his or her time hunting coyotes, searching for lost treasure, and fighting gun battles. These are not activities that the player really performs; rather it is fictional that s/he does these things.

A number of theorists have considered video games as fictive artifacts. Drawing heavily on critical theory, Barry Atkins's *More Than a Game* (2003) conceives of "game-fictions" as a new kind of "text," and conducts close readings of game-fictions such as *SimCity* (Maxis Software, 1989) and *Half-Life* (Valve, 1998). In *Hamlet on the Holodeck* Janet Murray, whose ultimate concern is wider than video games, considers the possibility of new types of fictional narrative inherent in interactive digital media (1997). Such accounts of video games as fictions have often been associated with so-called "narratology," and though they acknowledge that games present fictions, writers such as Atkins and Murray often seem more interested in stories than fiction per se.

And yet, within games studies there has also been some resistance to the idea that video games are fictions, or at least doubts that these fictional elements, even if they exist, are all that important to the game. Indeed, there are different concepts that we can use to refer to the ostensibly fictional content of games: Marston and the world in which he lives might be referred to as *virtual* or *simulated* items. At least one theoretician has claimed that video games, and the items depicted within them, are *virtual rather than fictional* (Aarseth, 2007). Other writers, though agreeing that games do involve fictions, have been tempted to downplay the centrality of this fictional aspect, seeing fiction as of secondary importance relative to game mechanics and gameplay (Juul, 1998, 2005).

We can formalize this situation into a thesis and two challenges. The *fictive thesis* has it that video games are works of fiction or minimally that they contain fictive elements. The two challenges to this thesis are: first, that the apparent fictional elements in games have a non-fictive status, and second, that if there are fictive aspects of video games, they are typically unimportant, merely constituting the background, narrative, or flavor of a game, where the critical aspects of games are the gameplay and rules. This essay will answer both of these challenges in order to understand the genuine role of fiction in video games.

Fiction and Game Studies

Game scholar Espen Aarseth has questioned the fictive status of the objects depicted in video games (2007). He argues that the elements depicted in video games have a different mode of being to those depicted in traditional fictions, concluding that the depictive elements in games "are ontologically different" to fiction (2007, p. 36). Aarseth's paper calls attention to a number of differences between the depictive artifacts of fictions such as novels and films and those found in video games, and takes these differences to show that the latter are not fictions. Referring to a difference between the dragon Smaug in Tolkien's *The Hobbit*, and a dragon as represented in the video game *EverQuest* (Sony Online Entertainment, 1999), Aarseth notes that the former "is made solely of signs, the other of signs *and* a dynamic model" (2007, p. 37, emphasis in the original). The claimed difference between Smaug and the dragon in *EverQuest* is clearly in terms of their *representational* m*edia*: one is represented through propositions and pictures, and the other through these things and a dynamic 3-D model, and this difference is genuinely apparent.

Aarseth is also tempted to make an ontological distinction on the basis of this media difference, and claims that because of its dynamic model the *EverQuest* dragon makes possible a number of modes of engagement that Smaug does not: "simulations allow us to test their limits, comprehend causalities, establish strategies, and effect changes, in ways clearly denied by fictions, but quite like in reality" (2007, p. 37). Virtual objects "can typically be acted upon in ways that fictional content is *not* acted upon" (2007, p. 36, emphasis in original). Hence, the depictive elements in video games are virtual items or simulations, and not fictions.

I have argued elsewhere these facts do not establish that the objects or events seen in video games are not fictions (2009) and I will discuss some of the reasons for this later in this essay. But Aarseth's claims do us an important service here: they make it clear that to address the challenge that video games are not fictions, and to explain the exact role that fiction takes in video games, we need to understand how, in the context of video games, fictions allow for the genuinely distinctive modes of interaction that he identifies.

Though he concludes that many games involve fictional elements, games scholar Jesper Juul has expressed doubts about the importance of fiction to games (1998). It should be noted that Juul has stepped back from these doubts, seeing fiction as having an important though partial role in games (2005). What is the basis of Juul's initial doubts? He formulates the following argument:

1. Rules are what makes a game a game.
2. Fiction is incidental to whether something is a game.
3. A game can be interesting without fiction.
4. A game with an interesting fictional world can be a terrible game.
5. Therefore, fiction in games is unimportant.

(Juul, 2005, p. 13)

Two aspects of this argument can be teased apart, and as they are stated both are more like assertions than arguments and so are worth unpacking. Premises 3 and 4 seem designed to provide evidence for premise 2, and they are comprised of contingent claims that depend on the evaluation of how games actually do employ fictions. Many games clearly have uninteresting, trite, or asinine fictions; a good example of this would be *Just Cause 2* (Avalanche Studios, 2010) where much of the fiction is unrealistic, juvenile, and clichéd (even though the gameplay is very good). Other games have interesting fictional worlds but are not even considered games by some; *Myst* (Cyan, 1993) being a traditional but contentious example of this. The claim, then, is that the separate evaluative fortunes of the fictive and gameplay aspects of video games show that these two elements are ontologically distinct, moreover (as claimed in premise 2) this shows that fiction is incidental to video games.

But neither evaluative observation shows that the fictive aspects of games are incidental to the games where it exists. That a video game might have an interesting world while being a poor game, or the opposite, merely shows that game designers do not infallibly produce good video games. In other *evaluative kinds* where the various aspects of the artifact can have differential success, the fact is not taken to have the ontological significance that Juul implies here. That a film has great cinematography and visuals while having an uninspiring narrative (James Cameron's *Avatar* (2009) is a candidate) is a contingent fact about the performances in that particular movie and does not have ontological implications for cinema itself. What this may display, however, is that the fiction and the game mechanics can be separately considered to the extent that the success or failure of each is an independent prospect.

The core of this argument resides in the substantive claims of premises 1 and 2. These premises are elaborated by various other remarks that Juul makes. For example, he notes that there is an asymmetry between the rules and fiction of a game in that "[t]hough rules can function independent of a fiction, fiction depends on rules" (2005, p. 121). According to this view the rules of a game have an ontological priority and are indeed constitutive of what a game is. This implies that the fiction of a game is mere *clothing*, unimportant to the identity of a given game or to its playing. In his earlier essay Juul went much further than this, claiming that the relationship between a game and its fiction is "arbitrary" (1998).

Juul's later statements on the relationship between a game and its fiction, where he steps back from his skepticism, are admittedly sometimes vague, perhaps because he lacks the proper framework to explain the relationship between a game and its fiction. My later observations on game ontology in this essay will provide such a framework. I will argue that premises 1 and 2, when applied to video games, assume an outmoded ontology, and moreover are false. In almost all video games, fiction is critical to game identity and gameplay. Exacerbating the problem here is that Juul's conceptualization of fiction is also indistinct, and he frequently gives the impression that he takes the fiction to be the world setting, or "narrative framing" of a game (1998). If true, this conception of game fiction might make the fiction seem eliminable or unimportant. Unfortunately, this characterization of the extent of fiction within video games is also false.

Video Games as Fiction

To really address the role of fiction in gaming, we need an understanding of the nature of fiction.

Within philosophy there is an extensive literature on fiction, though it usually takes as its concern fiction in its traditional forms such as novels, films, and plays (Currie, 1990; Lamarque, 1996; Walton, 1990). Critical to most such accounts is that fictional works are comprised of depictions of events, people, and places with an imagined existence, and that we as appreciators engage with these depictions by deploying our imagination. Of the imaginative attitude with which appreciators engage with fictions, Kendall Walton famously characterizes it as “make-believe” (1990), whilst Peter Lamarque argues that it is comprised of a distinctive “fictional stance” (1996). Though they have important differences, these philosophical views on the nature of fiction converge on the basic idea that fictions are portrayals of imagined events.

Because fictionality arises out of the pragmatics of imaginative representation, fiction is not tied to any one medium or depictive form. Though fictional narratives are commonplace, not all fictions are narrative in nature: because it presents an imaginative scenario a sculpture such as Brâncuşi’s *Bird in Space* (1923) may count as a fiction. Equally, narrative comes in both fictive and non-fictive varieties; Truman Capote’s *In Cold Blood* (1966) would be an example of a (largely) non-fictional narrative. So, in assessing the fictive nature of video games, it is not the depictive medium that is of immediate relevance, but that games depict events and objects with an imagined existence.

Are there non-fictional games? There may be some games that do not have such a fictive component; specifically, very abstract games that lack robust representational elements. It is not clear that the early game *OXO* (Alexander S. Douglas, 1952) or video game versions of Sudoku present a fiction; rather they seem to allow one to play these games in a computer setting. Similarly, we might question whether *Tetris* (Alexey Pajitnov, 1985) depicts a fiction; Juul thinks that *Tetris* is ambiguous in this respect (2005, p. 167). But even *Tetris* seems to make it fictional that there are objects falling down the plane of the screen. Indeed, the philosophers Aaron Meskin and Jon Robson argue that given Walton’s rather inclusive theory of fiction, it is difficult to conceive of video games that are not fictional (Meskin and Robson, 2012).

Nevertheless, most video games are rather more obviously fictions because they unambiguously include depictions of places, events, and characters with an imagined existence. John Marston is fictional in being imaginary. Equally, the world of this game is an imagined one, even if its locations bear a resemblance to real places in the American Southwest. The player of *Red Dead Redemption*, guided by the depictions of a fictive prop, imagines that a man named Marston exists and that he has the various features ascribed to him in that fiction. We subsequently learn Marston’s story, and also about the fictional world of the game.

But critically, this account of fiction also means that the *activities* that the player carries out in the game world, activities that constitute the gameplay, are fictional. Even though players routinely speak about *their own* activities in game worlds in the first-person, the player of *Red Dead Redemption* does not really ride horses, hunt coyotes, or have gunfights. It is fictional that these things occur because the player imagines that his or her character engages in these activities on the basis of the depictions produced by his or her involvement in the game. I’ve never lassoed a nun and placed her on the train tracks, though I have fictionally done this through the “fictional proxy” of John Marston (Tavinor, 2009, p. 70). Thus the fiction of a video game extends beyond the world setting and narrative, to constitute the very substance of a player’s apparent activities.

One feature of Walton’s theory of fiction in particular is informative here, because it allows us to reconcile the idea that video games are fictional works with the claim that they depict virtual or simulated items. Walton notes that works of fiction are comprised of “props” that allow us to generate fictional truths and so imagine the scenarios depicted in the work (1990, p. 63). Moreover, props are diverse as they can appear in different media, and can be designed or readymade items. The props that allow us to generate the fiction of a novel are sentences, whilst those in a film are audio-visual artifacts created through filming live action and increasingly through digital animation. The fictive props in video games are the graphical, auditory, and haptic elements of a video game display (Tavinor, 2009, pp. 61–85). In *Red Dead Redemption*, these might include the three-dimensional model of a horse, the soundtrack element that depicts the sounds of its hooves hitting the ground, and even the rumbling of the controller that depicts that the horse is tired when it has been ridden too hard.

Clearly, the substantial way in which these depictive props differ from those in traditional fictions is that they are also *interactive*. It is not possible for the audience to ride Little Blackie, the horse in the film *True Grit* (Joel & Ethan Coen, 2010). Rather, the audience is a distanced and passive observer because the props in that fiction are not designed to allow the interaction of the audience in a way that would generate a fiction that encompasses their own activities. But in video game fictions one *can* fictionally ride a horse or shoot another player because of the interactivity of video game props. As a result, the participative “game worlds” alluded to in Walton’s theory of fiction, and that he thinks encompass fictive appreciators within a game of make-believe, seem especially robust in the interactive fictions of video games (Walton, 1990, pp. 58–61).

Interactivity is another concept that has been a recent topic of some concern within philosophy and it is crucial to understanding the nature of video game fictions (Lopes, 2001, 2009; Smuts, 2009; Gaut, 2010). The philosopher Berys Gaut argues that “a work is interactive just in case it authorizes that its *audience’s* actions partly determine its instances and their features” (2010, p. 143; emphasis in original). Understood at the grain of depictions within a fictive work, an interactive depiction is one that can be employed by audiences to make things fictional of the work in which it plays a role. The graphical depictions of horses in *Red Dead Redemption* are interactive in that their manipulation allows the player to depict fictional horse riding in the world of the game.

It is this media difference that tempts Aarseth to claim that the depictive artifacts in games are not fictions, even though he is also reluctant to employ the concept of interactivity (1997, p. 48). But understanding the nature of interactive fiction allows us to characterize the relationship of fiction to virtuality, and to answer the first challenge described in the initial section of this essay. *Virtual* does not imply “non-existent” or “imagined”; rather, the concept of virtuality, in its vernacular sense, means *as good as*, or *amounting to*. A virtual item is one that bears the function of an original item in a non-actual way. Hence, virtual items are *isomorphs* of the items they depict or instantiate, allowing an interaction of the kind one might have with the actual object (Tavinor, 2011a). And so, via the Internet, one can shop in a virtual store and never leave the couch.

Similarly, the virtual horse riding seen in *Red Dead Redemption* exists because the depictive artifact in this case bears the function that actual riding has, that of using a horse as a means of transport. But this does not mean that the horse riding in *Red Dead Redemption* is not fictional; rather it means that the fiction is an interactive one, allowing the player to employ the fictive prop to make things fictional of the world of the game. In connection with video games then, virtuality is a distinctive mode of depiction, whereas fictionality regards the ontological status of what is thus depicted. Video games are typically *both fictional and virtual*. This is the effective answer to challenge one: simply, video games are *different kind* of fiction to those with which we have previously been familiar.

The Role of Fiction in Games

It remains a possibility that even though games are fictions, that this fictional nature is somehow superficial, inconsequential, or arbitrary. Understanding the genuine role of fictions in video games requires meeting this second challenge, and so to see how crucial fiction is in most modern games we need to understand how fictionality plays a role in the *ontology* of games. An ontological theory is one that explains the mode of existence of some item, detailing what is necessary to its existence, how it is created and destroyed, and how single items can be instances of a kind. It is widely understood that traditional games are ontologically rooted in their algorithms (Juul, 2005, p. 60; Lopes, 2001, p. 76). An algorithm is a set of rules that can be followed to solve a computational problem. Algorithms can be used for all sorts of computational processes, from arithmetical calculations to rendering computer graphics, but their significance here is that the ontology of video games can be partly characterized as an algorithm, because video game displays are generated by rule-following computational processes. When a video game is played, the algorithm produces the output of a graphical display from the input the player makes into the controls.

A traditional game such as chess is not identified with any of its displays—that is, arrangements of pieces on a board—but rather with the algorithm (conceived here as the set of rules that define the valid progressions of the game) that is used to produce such displays (Juul, 2005, pp. 16–63). This is because a single game of chess can freely move between different media, in that it can be depicted on a board using pieces, transcribed as a set of shorthand descriptions, or even instantiated in the head as in blindfold chess—chess, even in its individual instances, is a “transmedial” game (Juul, 2005, pp. 48–52). The medium in which chess is depicted thus seems genuinely incidental to the game’s ontology. Illustrating the same point is that a representational artifact perceptibly identical to a game of chess would not count as chess if it was not generated by employing the chess algorithm (perhaps instead being randomly assembled, or being generated through a subtly different game algorithm that uses the same pieces and that can produce similar board patterns). Hence, for traditional games such as chess, ontology may be properly characterized solely in terms of the game algorithm, and as a result the fiction may indeed be incidental to their nature. It is this ontological analysis of games that drives the intuitions that with video games too, the fiction is incidental (Juul, 1998).

This would be a mistake, however, because the ontology of video games is not adequately characterized in the mode appropriate to traditional games such as chess (Tavinor, 2011b). Algorithms, being functionally defined, are neutral with respect to their material *interpretations. Interpretation* here refers to the way an abstractly defined thing is given an instantiation in a material medium. It is in this sense that a formula in propositional logic is interpreted by filling in its representational variables. When we interact with an algorithm it is always through such an instantiation or display. This is the technical reason that allows traditional games such as chess to move easily between media, because in this case a change in material interpretation does not affect the identity of a particular game, or the game in general. But with video games, the nature of the material interpretation of the game algorithm *does* affect game ontology. (A necessary point of clarification is that the material interpretation being referred to here is primarily the *representational* or *depictive* medium of a game; there are additional complications that arise when one considers that video games can move between *software media* by being ported or appearing on emulators, without a subsequent change in game identity.)

To tease out the ontological necessity of fiction in video games, compare the games *The Elder Scrolls V: Skyrim* (Bethesda Game Studios, 2011) and *Fallout 3* (Bethesda Game Studios, 2008). When *Fallout 3* appeared many people considered it to be "*Oblivion* with guns," because *The Elder Scrolls IV: Oblivion* (Bethesda Game Studios, 2006) and *Fallout 3* shared a number of similar game mechanics (of course, that both games were produced by the studio Bethesda somewhat explains this). It was an additional irony that when *The Elder Scrolls V: Skyrim* appeared in late 2011, some people noted that it was "*Fallout 3* with swords." Underlying the joke is an important point; part of what differentiates these two games is their art, a significant component of which is their fictions. While *Skyrim* and *Fallout 3* do differ in terms of their game mechanics, their shared algorithm—the leveling system, perks, open-world gameplay, and so on—shows that an important part of what differentiates the games is that they have different fictions. *Skyrim* sets the characteristic open-world gameplay of both games within a fantasy world of dragons, swords and gold pieces; *Fallout 3* is set within a post-apocalyptic world of Deathclaws, laser guns, and bottle caps. These fictions partly constitute the material interpretation of these games, and hence with these games a change in fiction is clearly sufficient to impact on game identity.

How such games are played also bears out this ontological point. The algorithms of video games such as *Skyrim*, *Fallout 3*, and *Red Dead Redemption* are interpreted in terms of a fiction, and it is this fiction with which the player primarily engages. Playing *Red Dead Redemption* is composed of hunting coyotes, gun-fighting, and searching for bandits; these activities are all fictional, and what would be left of the game if these depictive elements were stripped away would be unrecognizable *as a game*, likely comprised of a non-playable collection of code. If one is to play this game at all, one must imaginatively engage with this content (Tavinor, 2009, p. 135). Hence the fiction in video games such as *Red Dead Redemption* is not merely a setting, background or "narrative frame" to the game, *but the means by which the game algorithm is depicted to the player*. (But note that a game algorithm can be given different instantiations depending on exactly who is interacting with it: a player will encounter the algorithm as interpreted in term of its fiction, while a programmer may encounter the algorithm as instantiated in a programming language or graphical toolset; however the latter interaction *does not instantiate the game*.)

I have developed these arguments into the general claim that the ontology of video games consists of an algorithm as interpreted by a set of artistic assets, a key part of which for almost all recent games is a fiction (Tavinor, 2011b). This ontology is crucial to understanding the various authorial and appreciative practices surrounding video games, but the important point here is that this ontology means that the exclusively algorithmic ontology appropriate to traditional games such as chess is no longer appropriate for video games. Video games are (partially) ontologically rooted in their fictions. This is the answer to challenge two to the fictive thesis.

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54

IDEOLOGY

Mark Hayse

When the word was first introduced by Antoine Destutt de Tracy in 1801, ideology meant an objective "science of ideas," worthy of guiding positive sociopolitical change in the world. Later, however, Marx relocated ideology within a cultural framework rather than a scientific one. He argued that ideology reflects the subjectivity and bias of those who craft it. Furthermore, Marx contended that cultural conditions (both material and economic) profoundly shape the ideas that, as a result, shape society. From a Marxist perspective, State-sponsored ideology creates a false consciousness that extends the State's control over the non-ruling class (Marx and Engels, [1939] 1978). Gramsci (1978) and Althusser (2001) add that various educational systems and private institutions can and do assist the State in this task. These various apparatuses elicit a certain kind of social and material practice, which in turn, propagates ideology. More narrowly, the apparatuses of popular culture propagate ideology, for they are constituted by privately-sponsored and economically-driven institutions that shape the conditions of existence for their consumers (Kavanagh, 1990). Thus, the particular apparatuses of video games—an important part of popular culture—mediate ideology, whether by default or design.

A wide range of writers discusses the meaning of video games in terms of ideology. Ideology connotes a variety of meanings and lends itself to a variety of usages (Boudon, 1989; Žižek, 2012). Those who explore ideological perspectives upon video games approach their work with various assumptions in mind. Nevertheless, their combined efforts testify to the significance of this topic. Video games mediate more meaning than first meets the eye.

Development within the Literature

In some of the earliest critical literature about video games, Kinder argues that the television—and by extension, the video game—functions as an ideological state apparatus (1991, pp. 37–41). In earlier eras, the family or school or church transmitted the dominant ideology. Now, however, the television transmits ideology for the young through cartoons, children's programming, and video games. In her analysis of the Nintendo Entertainment System, Kinder contends that video games "encourage an early accommodation to consumerist values and masculine dominance" (1991, p. 119). Provenzo (1991) agrees, noting that the good-versus-evil binary themes of early Nintendo games often cast women as passive victims, dependent rather than independent. Provenzo understands video games as "symbolic universes" that propagate a larger hegemony (p. 115). Kinder and Provenzo suggest as well that the video game ideology normally functions at the implicit or tacit level of a player's experience, rather than consciously.

Later, Frasca (2003) also approaches video game analysis within an ideological framework. He suggests that video game representations convey the ideological perspectives of their designers. For example, when designers include and exclude particular ethnicities within game action, the subtext of their design choices carries ideological weight. In addition, Frasca argues that video game rules function as ideological simulations or models. Rules reflect the perspectives and convictions of their designers, at once enabling and foreclosing player action and reflection. Frasca's typology of video game rules encompasses three dimensions: manipulation rules, goal rules, and meta-rules (pp. 231–233). Manipulation rules create possibilities for in-game action. Goal rules dictate and reward player actions in order to lead them to a winning scenario. Metarules allow players to change the rules through game modifications of their own design. In Frasca's words, his typology of game rules "can help us to better understand how the designer's agenda can slip into the game's inner laws" (p. 233). Elsewhere, Frasca calls for game designs that aid the player in "questioning the ideological assumptions of videogames" through critical dialogue (2004, p. 90).

Bogost (2006, 2007) offers the most comprehensive and sustained treatment to date of ideology in video games. He argues that video games inevitably represent "some small subset of the natural world, in a necessarily biased manner" (2006, p. 97). This bias is embedded, Bogost contends, in the unit operational and procedural structures of the video game. Bogost declares that "the most important moment in the study of a videogame" is that moment when, through practice, the embedded ideology of a video game is made concrete in a player's mind (2006, p. 99). Relying upon Plato, Aristotle, Marx, Gramsci, Althusser, Žižek, and Badiou, Bogost (2007) declares that video game rules, operations, and practices constitute a thickly ideological "procedural rhetoric," mounting persuasive arguments about the world and its order. Like Frasca, Bogost pleads for a critical approach to video game play that exposes, explores, and contests these arguments. Bogost reserves his harshest critique for the procedural rhetorics of commercial video games, arguing that "[c]ommercial games may be less deliberate in their rhetoric, but they are not necessarily free from ideological framing; such games may display complex procedural rhetorics with or without the conscious intention of the designers" (2007, p. 112). To Bogost, the "highly polished visual and sound design" (p. 49) of commercial video games lends an authority to their procedural rhetorics—an authority that can "occlude the ideological frames that such commercial games operationalize, rendering them implicit and in need of critique" (p. 113). Later literature follows Bogost's lead in regard to ideology and video games, such as Brown's (2008) analysis of propaganda games, Konzack's (2008) essay on philosophical games, Flanagan's (2009) design for critical play, and Squire's (2011) discussion of ideological video game worlds. All of these writers suggest that video game players should interrogate their play experiences, leveraging the power of critical thinking to expose implicit ideological frameworks.

Galloway (2006) presents a counterpoint to the ideological critique of video games: the *informatic* critique. He concedes that cultural phenomena such as video games are neither ideologically neutral nor innocent. However, Galloway suggests that the ideological critique of video games must be overshadowed by a "protocological critique" (p. 102) of "informatic control" (p. 105). By this, Galloway means that the digital *protocol* of video games tends to undermine the ideological meaning within video games. The informatic protocol of video games requires players to identify and master predictable, algorithmic patterns in order to win. Galloway's argument builds upon the precedent literature of Friedman (1999) and Manovich

(2001) who argue that computers demand that users think like computers. Galloway insists that this quality reduces cultural complexities to rigid, reductive, and reified structures (2006, p. 98). He concludes: “In modernity, ideology was an instrument of power, but in postmodernity ideology is a decoy” (p. 106). To Galloway, the computational architecture of the video game stakes a greater claim than ideology, because the former overwhelms the latter.

However, Dyer-Witheford and de Peuter (2009) suggest that the ideological critique still matters, contending that video games paradigmatically reflect and extend an ideology of Empire. Building upon Hardt and Negri (2000), Dyer-Witheford and de Peuter define the early twenty-first-century Empire as a globalized, capitalist System that harnesses immaterial labor in order to secure power through technologically produced and accumulated capital. Sounding an alarm, Dyer-Witheford and de Peuter declare that video games uniquely prepare workers for Empire. Video games provide a platform for immaterial labor, not physical labor. Video games perform the function of economic engines, not only through the accumulation of in-game points and virtual resources, but also for the corporations that design and sell the games. Dyer-Witheford and de Peuter lament: “A media that once seemed all fun is increasingly revealing itself as a school for labor, an instrument of rulership, and a laboratory for the fantasies of advanced technocapital” (2009, p. xix). They voice their hope for gamers who resist the socializing and enculturating influence of most video games by challenging and subverting their ideological trajectories.

Finally, Crogan (2011) argues that most ideological critiques of video games do not adequately account for the militaristic, cybernetic architecture upon which the computer stands. He notes that video game studies “seem to prefer neither to dwell on the legacies of these beginning nor to follow the story too closely” (p. xiv). As Crogan recounts the military origins of the computer, he explains that its “logistical trajectories” have “overdetermined” its usages and applications (p. xxv). In particular, he contends that military operations undergird the engines of video game play: tracking, targeting, shooting, acquiring, navigating, and striking (p. xxvii). Interestingly, an analysis of first-generation Atari VCS game cartridges lends support to Crogan’s point. Seven of the Atari VCS’s first nine video games—*Air-Sea Battle*, *Combat*, *Indy* 500, Star *Ship*, *Street Racer*, *Surround*, and *Video Olympics* (all Atari, 1977)—procedurally hinge on these so-called military operations, while only *Basic Math* and *Blackjack* do not. Of course, the same analysis holds true for their progenitors: Higinbotham’s *Tennis for Two* (1958) at the Brookhaven National Laboratory, as well as *Spacewar!* (Russell et al., 1962) at the Massachusetts Institute of Technologies. Crogan concludes that the just as the computer aids the military in cybernetic prediction and preemption of contingencies, so cybernetic logic “cannot be overestimated as a transformative stimulus in social, political, and technocultural existence”—including the design and playing of video games (2011, p. 169).

Implicit Curriculum and Ideology

Education scholars often refer to the implicit curriculum as a helpful framework for identifying ideological agendas in learning environments. Although video games can and do function as learning environments (Gee, 2007; Squire, 2011), critical video game scholarship rarely deploys the language of implicit curriculum, despite its utility. Education scholars describe the implicit curriculum as a "hidden" curriculum that is "covert," "inferred," and "concealed" (Snyder, 1973). It is taught indirectly through the "rules, regulations, and routines" of learning environments (Jackson, 1968). Through its "silent language," the implicit curriculum also functions as a "haunted curriculum" in which the "ghosts" of classroom architects past exert a steady, subtle influence upon the learning environment today (Meighan, 1981). Dewey describes the implicit curriculum in terms of "collateral learning" through the "formation of enduring attitudes, likes, and dislikes," attitudes which are "fundamentally what count in the future" (1938, p. 48). Bowers suggests that the implicit curriculum is "learned and reinforced at the tacit level where neither teacher nor students are fully aware of the cultural patterns that are being learned" through classroom assumptions and procedures (1988, p. 43). Thus, the implicit curriculum mediates the propagation of an "operational ideology" (Eisner, 1992).

Although some video game designers may intentionally deploy their platforms for ideological propagation, it is just as likely—if not more so—that video game ideology is a byproduct of cultural inheritance and technological precedent. The video game designer rarely starts from scratch. Instead, designers utilize game engines as templates, toolsets, and palettes for their creative work. These game engines "construe entire gameplay behaviors" (Bogost, 2006, p. 57). For example, Bogost notes that most game engines support "visual and physical experience rather than emotional and interpersonal experience" (p. 64). They reflect the particular cultural perspectives of their designers (p. 65) as well as a long history of technological precedents. To borrow from Meighan's haunted curriculum, the ghosts of computer builders and software designers past continue to exert a steady, subtle influence upon the imaginations and practices of designers and players alike. A cursory, historical survey serves to demonstrate that, to date, video games often deploy the subroutines of tracking, targeting, shooting, acquiring, navigating, and striking as the procedural heart and soul of game play. Ideologies such as militarism, capitalism, utopianism, conservatism, liberalism, imperialism, sexism, and racism provide relatively easy targets for the crosshairs of video game criticism. However, the subtler ideologies implied within computational procedures and structures seem harder for many critics to detect. While politics serve up easy topics for debate, post-industrial culture tends to assume the neutrality of its computer technology. Nevertheless, persistent critics such as Friedman, Galloway, Witheford, de Peuter, and Crogan remind us that computers and video games are not blank slates. Instead, technologies present a point of view uniquely their own. Aoki sums it up well: although the computer "extends man's capabilities in rule-governed behavior," it may also extend "his will to master, to control, and to manipulate" ([1987] 1999, pp. 169–170).

Ideologies in the Civilization Series

The *Civilization* series of turn-based strategy games serves as an ideal introduction to the analysis of ideology within video games, as evidence by the proliferation of scholarship that surrounds this series. The *Civilization* series requires the player to direct a civilization's development from its initial appearance to global dominance. Along the way, the player explores the geographic frontier, deciding whether or not the civilization will grow through technological research, economic expansion, diplomatic relations, or military campaigns. The game unfolds on a macro-scale, leading Friedman (1999) to comment that *Civilization II* (MicroProse, 1996) depersonalizes the violence of colonization. He further notes that the gameplay of colonization proceeds within an oversimplified, binary context, suggesting that “global co-existence is a matter of winning and losing” (p. 145). Similarly, Mäyrä notes that the *Civilization* series favors Western industrialism, an ethnocentric view of non-industrialized cultures, the inevitable triumph of technological progress, and the mission of colonization: “the underlying history and largely unquestioned ideologies of an entertainment product from the 1990s United States” (2008, pp. 98–99).

Other critics maintain that any supposed historic and cultural significance of the *Civilization* series takes a back seat to its ludic—or game-like—qualities. For example, Galloway (2006) argues that the algorithmic nature of *Civilization III* (Firaxis Games East, 2001) reduces whole people groups to oversimplified types:

> In this game, one learns that Aztecs are “religious” but not “industrious,” characteristics that affect their various proclivities in the gamic algorithm, while the Romans are “militaristic” but, most curiously, not “expansionistic.” Of course, this sort of typing is but a few keystrokes away from a world in which blacks are “athletic” and women are “emotional.” That the game tactfully avoids these more blatant offenses does not exempt it from endorsing a logic that prizes the classifications of humans into types and the normative labeling of those types.
>
> (p. 97)

Although Galloway contends that this reductionist approach flattens cultural differences, he also concedes the necessity of simplistic design within simulation modeling. Thus, Galloway maintains that the computational logic of *Civilization III* overwhelms its historical and cultural pretense. To Galloway, *Civilization III* is about the absence of history and the triumph of informatics. Similarly, Myers (2005) argues that replay inevitably renders the *Civilization* series as games, not history. To Myers, frequent play gradually moves strategic systems management to the foreground as the cultural impact of video games fades into the background.

Nevertheless, Squire (2011) insists that the *Civilization* series has much to say about both history and ideology. He credits these games as a catalyst in his own academic trajectory toward history and education (p. 20). Indeed, this series has been a primary research concern across his career to date. Squire describes the *Civilization* series in terms of “‘ideological worlds’ in that they instantiate ideas through implicit rule sets and systems (rather than by telling stories). The word *ideological* tries to capture that they are built according to theories of how the world operates (implicitly or explicitly)” (pp. 28–29). Squire adds that this built-in bias is a strength of video games instead of a weakness, because it forces players to critically confront ideological assumptions (p. 24). Squire acknowledges four prevailing perspectives in regard to bias within the *Civilization* series. Some argue that the series propagates the supremacy of strategic management, while others contend that the series teaches an ideology of techno-utopianism through scientific progress. A third perspective critiques the series from a Marxist perspective, while a fourth perspective maintains that the series teaches the supremacy of geographic location (pp. 25–26). Squire’s research findings show that young players do interrogate the implicit ideological perspectives of the *Civilization* series, rather than uncritically swallowing them hook, line, and sinker (for example, pp. 125, 133–137).

Ideology in World of Warcraft

As with the *Civilization* series, the *World of Warcraft (WoW*) (Blizzard Entertainment, 2004) franchise elicits much ideological analysis from video games scholars. This franchise continues to represent the state of the art among MMORPGs (massively multiplayer online role-playing games). Within the fantasy world of Azeroth, players customize and manage the virtual lives of avatars that are engaged in an unending struggle between law-and-order (the Alliance) and chaos (the Horde). Within *WoW*, players pursue quests and other missions in official guilds, informal pick-up groups, and strategic raiding parties. Successful players gain experience points and copper, silver, or gold pieces. In turn, these resources deliver increasing levels of power, reputation, and social capital to players. At the explicit level, *WoW* seems to deliver an experience of harmless escapism to those who enjoy critical thinking, strategic planning, and social networking within virtual setting. At the implicit level, however, *WoW* arguably propagates a curriculum thickly laced with ideological significance.

Rettberg (2008) contends that *WoW* reflects and reinforces a corporate (or capitalist) ideology that extends Weber's protestant work ethic. For example, Rettberg notes that the cultural practices of *WoW*—education, labor, and commodity trading—serve as a path to self-improvement, acquisition, and wealth (pp. 25–30). He also argues that *WoW* guilds and quests assimilate players into a broader, corporate discourse:

> [T]he game is training a generation of good corporate citizens not only to consume well and to pay their dues, but also to climb the corporate ladder, to lead projects, to achieve sales goals, to earn and save, to work hard for better possessions, to play the markets, to win respect from their peers and their customers, to direct and encourage and cajole their underlings to outperform, and to become better employees and perhaps, eventually, effective future CEOs.
>
> (p. 20)

On one hand, Rettberg concedes that *WoW* provides escapism from a so-called "real life." On the other hand, he concludes that this escape from work ironically ushers players into another world of work (p. 26). Not all critics agree, however, that this is such a bad thing. McGonigal (2011) asserts: "Playing *World of Warcraft* is such a satisfying job, gamers have collectively spend 5.93 million years doing it" (p. 52), at an average of 500 hours of game play per player (p. 54). She contends that the cultural practices of *WoW* usher players into the enjoyment of meaningful—even liberating—work.

In contrast to Rettberg and McGonigal, Langer (2008) argues the case that *WoW* propagates racist ideology. She observes that familiar human figures populate the Alliance while exotic animalistic figures populate the Horde. More particularly, Langer notes that the cow-like Tauren are characterized by the hair styles, names, settlements, and music of stereotypical—yet inauthentic—Native American culture. Thus, the lines of play are divided along racial lines of "familiar and foreign," not good and evil (p. 88). Langer also suspects that *WoW's* "use of real-world cultural inflection is often so simplified that it invites a similarly simplified view of the entire corresponding culture" (pp. 91–92). She concludes that, "the people whose cultures are being appropriated in *World of Warcraft* are in a double bind of sorts. They are marginalized both in the real world … and in the game world" (pp. 102–103). Regularly, Alliance forces raid

Tauren settlements that exist at the borderlands between civilization and frontier. Thus, the Tauren are subjected to repeated campaigns of colonization and oppression, just like the Native Americans who inspired their design (p. 94).

Conclusion

The ideological analysis of video games is not limited to the *Civilization* series and the *World of Warcraft* franchise. Ideological critiques of many other game series have been mounted, including critiques of *SimCity* (Friedman, 1999; Galloway, 2006; Bogost, 2006; Turkle, 2006), *The Sims* (Frasca, 2003, 2004; Konzack, 2008, Squire, 2011), *America's Army* (Bogost, 2007), *Grand Theft Auto* (Bogost, 2007; Dyer-Witheford and de Peuter, 2009), as well as the Games for Change movement (Bogost, 2007; Dyer-Witheford and de Peuter, 2009). Video games reflect the imaginative—and ideological—perspectives of their designers in terms of narrative, image, and procedure, much as myth, symbol, and ritual convey culture. Some of this happens at an explicit level but much more likely occurs at an implicit level that designers and players alike may consciously overlook. Media and technology theorists echo this conviction, arguing that media messages and media machinery tend to amplify or enhance certain perspectives while reducing or obsolescing others (Ihde, 1979; McLuhan and McLuhan, 1998). Of course, media critics are no more neutral than the objects of their analyses. Nevertheless, the ideological interrogative for video games is not a question of "whether or not," but rather "what kind," "what ways," or "how much."

Other critics insist, however, that the military-industrial logic of computational structures tends to overwhelm its particular applications (Noble, 1988; Postman, 1993; Halter, 2006; Crogan, 2011). The military-industrial complex spawned the computer in its own image with clear goals in mind: simulation, control, and the elimination of contingent obstacles. In other words, computers exist to extend human mastery and domination. Wink (1992) argues that this quest for mastery and domination is as ancient as Babylonian religion. The Babylonian empire imagined that the god Marduk slew the goddess Tiamat as a lawfully-sanctioned act of violence against the forces of chaos that threatened imperial order. Wink refers to this story as "the myth of redemptive violence," arguing that it "undergirds popular culture" (p. 13). Wink also describes this myth as "nationalism become absolute" (p. 30). If computers extend mastery and domination, do they also contribute to the reification of imperially-sanctioned redemptive violence? Moreover, do video games unwittingly popularize the various expressions of imperially-sanctioned redemptive violence through a digitized "media catechism" (Giroux and McLaren, 1992, p. xxiv)? A brief survey of video game history seems to reflect an early tradition of control, manipulation, and domination that reflects a military-industrial vision (Toles, 1985; Burnham, 2001). Have video games now transcended this birthright? Perhaps that horizon still lies ahead.

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55
IMMERSION

Carl Therrien

A Tale of Two Meanings

Immersion as Illusion

In their effort to assemble the different theories of immersion into a joint framework, Frans Mäyrä and Laura Ermi have proposed the SCI model (2005), where three types of immersion are defined and intersect in the gameplay experience: sensory immersion, challenge-based immersion, and imaginative immersion. Although there is some overlap between the elements of this segmentation, it will be a useful entry point into the semantic web of immersion.

Of Mäyrä and Ermi's three types, "sensory immersion" is the one that corresponds the most to the original meaning of the word. "Immersion" comes from the Latin "*immersio*," meaning to submerge a body in water. It has been used metaphorically in the context of cultural and linguistic exchanges, referring to the feeling of being enveloped by different social norms and engaged in an intense learning situation. It is also associated with the feeling of being transported into a non-immediate reality in the context of mediated representations. In these cases, it is generally linked causally to the degree of vividness or credibility of the represented reality. The development of new interfaces in the military and scientific contexts of the 1970s onward brought the term to prominent use, along with relative concepts such as telepresence and presence. In their literature review, Matthew Lombard and Theresa Ditton (1997) highlight this overlap between the various usages; the fourth definition of presence is synonymous with immersion. "Perceptual immersion," the authors note following Biocca and Delaney, "can be objectively measured by counting the number of the users' senses that are provided with input and the degree to which inputs from the physical environment are 'shut out'" (1997). This definition of immersion or presence is rather mechanical: a "reality engine" produces illusions, and the perceptual saturation—the number of senses that are addressed, as well as the quality of the illusion—exhibited by this device determines the user's immersion. In this view, IMAX movies are very immersive, interactive virtual reality apparatuses are leaps ahead, and a comic book is not very engaging.

This type of immersion and the media that were created to maximize it have been studied extensively by Oliver Grau in his book *Virtual Art: From Illusion to Immersion* (2003). Grau inspects a variety of art practices that are all based on the same principle: surrounding users completely in a space of visual illusion. This immersive strategy is the main focus of the book; it leads, according to the author, to a different mental state, “characterized by diminishing critical distance to what is shown and increasing emotional involvement in what is happening” (2003, p. 13). The most interesting aspect of this study comes from the realization that human cultures have tried to submerge the senses completely since antiquity at the very least. “Landscape chambers” were discovered in the ruins of wealthy villas. For instance, all vertical walls of the *Villa dei Misteri* (60 AC) were fully painted in order to depict a continuous scene, most likely a bacchanal celebration. The main type of immersive strategy studied in the book is 360-degree visual illusions, with other significant additions, such as linear perspective in the famous *Sala delle Prospettive* (Baldassare Peruzzi, 1516) or in baroque churches. Grau’s ambition is to establish a link between these exceptional illusion spaces and the more recent development of virtual reality apparatuses, which also seek to submerge the senses, with the addition of direct adaptability of the virtual images to the users’ movements. It is because of this common ground that the author speaks of all the objects in his corpus as “Virtual Art.”

It would be easy to read the evolution of video game as an “arms race” toward evermore powerful processors that are dedicated to the creation of photorealistic virtual worlds. As Aki Jarvinen (2002) has pointed out, photorealism is but one of many visual styles used by video game creators. But clearly, it is an obsession to create ever more realistic and senses-luring special effects, through complex geometry, high-resolution photographic textures, and lighting and shadowing effects. On a purely perceptual basis, contemporary video games can create very convincing illusions, but expert eyes can still perceive imperfections—jagged lines due to poor resolution, blurry textures, frame rate drops, geometry pop-in, pixelated shadow maps, etc. Although newer products don’t always focus on the audiovisual capabilities of games, the fascination with illusion-making is likely to stimulate the constant renewal of technological props, until—if ever—a satisfactory configuration emerges.

Immersion as Psychological Engagement

The second most common usage of the word “immersion” is associated with a particularly engrossing state of mind, a concentration of mental resources in the course of a specific activity. In Mäyrä and Ermi’s model, it corresponds more closely to the “challenge-based immersion.” This definition is associated with the empirical studies conducted by Mihaly Csikszentmihalyi in the 1970s. Csikszentmihalyi set out to better understand the structure and dynamics of autotelic activities (i.e. activities that are gratifying in and of themselves). He interviewed several alpinists, chess players, rock climbers, as well as practitioners of a demanding profession (surgeons). All participants related a similar experience: in the course of their hobby, periods of intense absorption emerge and eventually seem to blur the limits of the self and the world around. For instance, one alpinist declared:

> One tends to get immersed in what’s going on around him, in the rock, in the moves that are involved … search for handholds … proper position of the body—so involved that he might lose consciousness of his own identity and melt into the rock.
>
> (1975, p. 43)

The defining aspect of this flow experience, according to Csikszentmihalyi, rests on the optimal usage by an individual of specific skills. The structural elements highlighted by the original study are: attention focussed on the task, limitation of the stimulus field, balance between challenge and skills, clarity of the goals and of retroaction; all these can explain the autotelic nature of the experience, and eventually the transcendence of the self's limits through action.

The key element of Csikszentmihalyi's theory is the balance between skills and challenges. This is what allows the individual to enter an ideal flow channel, where the challenges are increased at the right pace, mimicking the learning experience and development of operational schemata in the individual. The flow channel refers to the ideal progression through the experience, where states of anxiety or frustration are avoided. However, challenges that have been mastered repeatedly are prone to boredom, and cannot sustain interest. The flow experience is thus linked causally to the idea of an adequate balance between skills and challenges:

> If there were complete congruence, there would be nothing that was not already known and the object would hold no interest. If there were no overlap whatsoever, there would be no point of entry, nothing to allow viewers to exercise their skills.
>
> (Csikszentmihalyi and Robinson, 1990, p. 134)

Needless to say, many aspects of ludic activities bear a striking resemblance with the structural aspects put forward by Csikszentmihalyi: limitation of the spatial field of play through arenas and boards; classification of players and challenges to favor "fair play," etc. Video games have developed this aspect to a great extent through many assistance systems. Clear instructions on arcade cabinets and in game manuals have been around since the first days, and are now integrated dynamically in the first moments of the interactive experience. Algorithms can detect specific performance aspects and provide tailored information to players; recent games provide textual hints even before the player shows any sign of struggle or failure. Adjustable difficulty settings have also been around since the early days, and recent offerings such as *Left 4 Dead* (Valve, 2008) or *The Elder Scrolls IV: Oblivion* (Bethesda, 2006) dynamically adjust the challenge covertly while the player is performing. Spatio-narrative guidance systems are omnipresent in open worlds as well as linear virtual environments; arrows, lines, and "golden trails" indicate clearly the path to follow in order to progress. All these design elements seek to keep the player in a certain comfort zone and avoid frustration. Yet, some expert players are complaining that they take away much of the challenge.

Immersed in Fictional Worlds

The evolution of sensory illusion as envisioned by scientific experiments or in science fiction is the starting point for Janet Murray's conception of immersion. In *Hamlet on the Holodeck*, the famous Star Trek device is used as a clear example of what a future medium could achieve. The holodeck feeds first and foremost on the ideal of a perfect "reality engine," an illusion-producing black box that can create holographic—yet tangible—realities, able to fool many of the senses perfectly. This vision of immersion as a consequence of illusion-making has been criticized by many scholars, including Salen and Zimmerman (2003). But beyond illusion-making, Murray's take on the holodeck also shifted the attention from sensorial dupery to the actual believability of the depicted world:

> [it proposes] an illusory world that looks and behaves like the actual world […] The Star Trek holodeck is a universal fantasy machine […] a vision of the computer as a kind of story-telling genie in the lamp. [Users] participate in stories that change around them in response to their actions.
>
> (1997, p. 15)

In the context of mediated immersion, the goal is ultimately to visit another world, and Murray highlights the challenges—and lays out some potential solutions—to realize the interactive medium's promise to adapt to the users' action in this world.

Moving from the illusionistic qualities of the medium to the virtual world itself, we reach Mäyrä and Ermi's third type: imaginative immersion. They describe it as the feeling of transportation that can happen in literary and cinematographic media, which became ideal vehicles for portraying expansive narrative worlds. Even though the focus has shifted, discussions regarding immersive worlds often focus on the realism of the depicted events and characters, and thus can be seen as a continuation of the illusory definition of immersion. This is laid out directly in the literature about presence. Lombard and Ditton have gathered many uses of the term that refer to the idea of "social realism": "Social realism is the extent to which a media portrayal is plausible or 'true to life' in that it reflects events that do or could occur in the nonmediated world" (1997). The authors present a rather simplistic view of this aspect: "a world with a green sky, flying trains, and misshapen animals that speak Chinese would surely seem more surreal than real, and therefore would be less likely to evoke presence" (1997). Similarly, Thomas Pavel claimed that "make-believe efforts" vary according to the relative socio-cultural proximity of the fictional world and the user's actual world experience (1988). Yet, fantasy literature is full of these otherworldly aspects, while enjoying incredible popularity; the intertextual knowledge developed by fans in their consumption of this literature and the strength of the involvement they experience seem to contradict the restrictive definition of presence put forth by the authors. As Marie-Laure Ryan points out,

> There is no point in denying that the worlds of the stereotyped texts of popular culture are the most favorable to immersion: the reader can bring in more knowledge and sees more expectations fulfilled than in a text that cultivated a sense of estrangement.
>
> (2001, p. 97)

A discussion about the coherence of character and plot twists in fictional worlds would be a relevant avenue to inspect in this regard.

In *Narrative as Virtual Reality: Immersion and Interactivity in Literature and Electronic Media* (2001), Marie-Laure Ryan seeks to explain the journeys into any kind of narrative fictional world as a virtual reality experience. Building on possible worlds theory, she conceives immersion as the transportation of one's consciousness from the actual world to a non-actual possible world. This transportation can be facilitated by the specific nature of each media and, in each narrative type, various representational strategies. For instance, she discusses what types of discursive constructions facilitate this act of mental relocation on the part of the reader. This is obviously a continuation of immersion as illusion-making, but the most illusionistic strategies are not always the best in her study of the "text as world." This aspect has also been pointed out by Jean-Marie Schaeffer's *Pourquoi la fiction?* (1999); this seminal effort sums up many of the propositions laid out in other theories, and opens up to the realm of cognitive and neurological sciences.

Immersive Paradoxes

Jean-Marie Schaeffer's theory of fictional immersion is ambitious: founded on the mimesis principle, it encompasses the illusion-making aspect of mediated worlds, while acknowledging the cognitive distance implied by what we call "fiction." The framework also seeks to include all media practices that are associated with fiction, from pictorial arts to contemporary video games. Since the introduction of interactivity has often been presented as being at odds with traditional world-building techniques in movies and literature, Schaeffer's position is boldly transmedial. It states that all fictional apparatuses are built on illusion-making, a "key" to accessing fictional worlds, and that these access keys trigger a corresponding immersive posture. This posture, insists Schaeffer, is similar to one or many of our ways to relate to the world around us on a daily basis. The pretend speech acts laid out in a novel are read and understood as any other narrative; the moving images at the theatre are perceived just like any documentary shot would be, and might even bring about a strong visual identification (as was stipulated by Christian Metz with the concept of primary identification); the simulation of retroaction between an agent and a world in virtual reality and video games makes us identify with an alter ego, in a way that implicitly refers to the way we interact in real life. The premises of the theory can be seen as a reversal of the classic "willing suspension of disbelief" associated with Coleridge; at a very fundamental level of the experience, users don't need to actively overlook the mediated nature of the representations, but are treating the illusion just as any other similar stimuli. Their basic perceptual and linguistic systems are prone to give credibility to perceptions/assertions; users have to fight to suspend this natural tendency to "believe" and determine the referential level of the objects they are perceiving.

Schaeffer's theory insists on the various illusion-keys that let us access a world model. The basic overarching posture is one of mimetic immersion, which is triggered naturally in human beings in non-fictional contexts; Schaeffer highlights the fundamental importance of learning through imitation in children. Fictional apparatuses, then, are a subgenre of this mimetic immersive activity in that they call upon another mental aptitude: a cognitive framing of the illusions that prevents users from reacting inappropriately or to acquire false beliefs. This cognitive activity is itself encouraged by framing operations typical of make-believe activities: the frame of the stage or movie shot, various editorial strategies, etc. Thus, the fictional version of mimetic immersion is based on a "decoupling" between the illusion and its potential effects:

> its potential consequences in terms of beliefs, in terms of motor reaction, and even in actantial terms, are neutralized by the pragmatic frame of shared make-believe—even when fictional immersion *is* actantial (as that of the actor [and of video game players]).
>
> (1999, p. 136, freely translated)

This formulation is especially interesting in order to better understand the complex posture of a video game player: the depicted events evoke certain knowledge from our daily experience, but even the most recent natural interfaces don't use our daily motor knowledge perfectly, and part of the fun is that we are freed from some of the constraints of physical and social life. Racing in a virtual world allows us to be much bolder and adventurous than we could ever be in real life. It is no wonder that the thrills of morally reprehensible actions are also explored in many games. Moreover, Schaeffer's conceptualization of immersion highlights the fluidity of immersive postures in the course of the experience, just like children in games of make-believe go in and out of the world they create all the time. According to him, readers switch from the position of a narratee to partial identification with the figure of the narrator; moviegoers identify with the perceptual flows, while still being addressed by verbal narrators. This idea of variability of immersive posture goes against the simple illusionistic conception, and is especially suited to talk about the video game experience. Players control an avatar or a point of view as one would remote control an electric puppet or car, yet they get to incorporate these controls on a visceral level; they are looking at images that mimic to some extent our natural perception, but the typical screen is cluttered with arbitrary signs—such as the various assistance features highlighted earlier—that represent a new form of visual narration, and complicate further the immersive posture. As Schaeffer points out: "the variability of the modalities of an immersive posture is one of the most important factors in the cognitive richness of artistic fictions, since it allows the creation of multiple perspectives (or access points) of fictional worlds" (1999, p. 258, freely translated).

Flowing Forward

Schaeffer's theory of fictional immersion is certainly one of the most ambitious and complete conceptualizations. It highlights the illusion-making aspects of the phenomenon while acknowledging the essential work of cognitive framing in the experience of fiction. All aspects of the theory are based on age-old propositions from Plato and Aristotle, which are connected with more recent findings in linguistics and biology. Contemporary research in neurosciences tends to corroborate Schaeffer's vision of a "gullible" perceptual system easily fooled by illusions. For instance, Joseph Ledoux's study on the emotional unconscious/innate fear system highlights how the body's reactions can be triggered by very simple stimulus inherited from our long evolution (1996). Research on mirror neurons allows us to explain the contagiousness of emotional faces, the perception of pain and of certain hand gestures (Iacoboni et al., 2005). As Torben Grodal observes: "Via mirror neurons, the facial expressions' emotions resonate in the onlooker, and that explains the emotional contagion emanating from close-ups" (2009, p. 187). It is these recent developments of cognitive and neurological sciences that have led Grodal to create his PECMA flow framework, in order to better understand the different elements at play in the reception of mediated worlds.

PECMA stands for Perception, Emotion, Cognition, Motor Activation. Grodal acknowledges the entanglement of all these processes in our daily experience and media consumption, but the acronym is still supposed to represent a logical "progression" in our perceptive-cognitive system, with different type of artistic works making the flow "stop" at certain "stations." For instance, the abstract films of Norman McLaren such as *Dots* (1940), *Lines: Vertical* (1960), or *Lines: Horizontal* (1962) are especially appealing to the visual cortex and can be engaging solely on that particular level. More typical narrative films or novels involve semantic memories and world-building capabilities (agent intentions, ordering of events, anticipation of future developments, etc.), which occur within the prefrontal cortex. Movies are able to trigger the premotor and somatosensory cortex, for instance via mirror neurons, and thus can help viewers feel part of the action in a visceral way. But in a very literal sense, only interactive media trigger our motor cortex directly.

As I've pointed out, even natural interfaces require learning new motor schemata. So in a paradoxical way, interactive media require the assimilation of more intertextual knowledge in order to get immersed in the experience. As such, even video games require us to use an "inhibiting function," similar to what Schaeffer refers to as the cognitive framing of fiction: "Those inhibiting functions develop in children in tandem with their ability to understand pretend behavior and false belief" (Grodal, 2009, p. 150). But contrary to Schaeffer, Grodal seeks to highlight the very distinct nature of the interactive experience:

> Interactive media such as video games have given rise to new types of experience that allow for the fusion between the roles of spectator and participant. These interactive media games offer the possibility of an entirely new type of immersion, involving even the element of concrete motor action in the PECMA flow.
>
> (Grodal, 2009, p. 187)

In the end, one can still wonder why novel enthusiasts, moviegoers, and game players are willing to invest so much cognitive, affective, and motor efforts in the enjoyment of their favorite fictional worlds. Here, Dolff Zillmann's theories of suspense are revealing (1996), and allow us to make a clear link with Csikszentmihalyi's theories. For Zillmann, one of the motivations to assess cognitively and enjoy dysphoric emotions in suspenseful episodes can be summed up by the concept of "affective overreaction"; once users are aroused—here in a negative way—by a representation, the resolution of the tension will be enjoyed even more; excitation overlaps from dysphoric to euphoric feelings. Thus, "the investment of efforts" acquires an autotelic nature, since users have built expectations on the gratifying nature of the experience. And that is certainly a trait of popular fiction across a variety of media and practices.

As we have seen, the various theories of immersion propose a particularly rich framework to analyze and address the complexity of the video game experience, and are able to accommodate very recent findings from a variety of disciplines. Semiotics and aesthetic theories are augmented with propositions from cognitive sciences and recent findings in neurology in an effective way, shedding light on the common yet very complex phenomenon of fictional immersion. The broadness of this cultural practice—ranging from stage acts, to pictorial arts, to spoken and written narratives, and contemporary video games—necessitates more than an transmedial framework; it can only be addressed meaningfully by adopting a multidisciplinary approach.

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56

MEANING

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Video games matter.

Residing in that phrase is the premise that video games mean something to the people who play them, the designers and companies that produce them, and the cultures in which they are made and played. What video games mean is dependent on a variety of contextual factors. Games such as *Final Fantasy VII* (Square, 1997) or *Super Mario Bros* (Nintendo, 1985) mean a variety of things, from the nostalgia they may trigger in gamers who played them to the personal stories, thoughts, or discussion about these games can prompt, to the impact they had on the adoption and use of the Sony PlayStation and Nintendo Entertainment System respectively. There is also a level of cultural meaning stemming from these two games, as both are products of Japanese culture, but were widely played around the world.

The meaning of games varies depending on context and there are typically multiple meanings to any game. Video games mean different things to different people in different situations; each game typically has many levels of meanings. However, meaning in games can be divided into three general areas: the meaning of games, the meaning in games, and the meaning created around games and game culture. The meaning of games is connected to their role as cultural objects and media products. The meaning in games focuses on the development and execution of games and how meaning is expressed within a given game. The established and growing community surrounding video games ensures that there is also meaning that develops around games, from the discourse of professional gaming to the socially-determined roles, practices, and language of gamers. The boundaries among these categories are blurry, but each demonstrates a particular dynamic of how games signify. Although these three areas are not exhaustive, they are comprehensive enough to illustrate how video games mean, what they mean, and why their meaning matters, which gives those interested in studying and analyzing games a new way to look at a favorite activity.

Before moving through these three categories of how games contain and express messages, it is appropriate to denote my positionality. As a communication studies scholar schooled in rhetorical analysis, my beliefs about meaning are shaped by my academic background. Rhetoric is often concerned with questions of meaning, as the discipline is about “the study of what is persuasive” (Campbell & Huxman, 2009) and is founded on Kenneth Burke’s belief that the reality we “see” is predicated on the symbol systems we use (Burke, 1966). For rhetoricians like me, questions of meaning can be found everywhere as rhetoric “is a way of knowing; it is epistemic” (Scott, 1967) and “everything, or virtually everything, can be described as ‘rhetorical’” (Schiappa, 2001). Rhetoric has become a “perspective, one that accounts for the production, circulation, reception, and interpretation of messages” (Zarefsky, 2008). It is this perspective, which is based on the influence and power of symbol systems, that shapes where I find meaning in games.

Meaning of Games

The first way that video games mean is in the sociocultural frame tied to their role as cultural objects and media products. Video games are an increasingly powerful and consumptive media form, with total revenues expected to grow to $81 billion worldwide by 2016 (Takahashi, 2011). The industry is a large enough social force that a hit video game can generate over a billion hours of play time over the course of a calendar year (Gaudiosi, 2012). The growth in the social relevance of video games creates a situation where the broad, social meaning of games is a crucial part of the discourse of video games. To this end, the meaning of games is typically tied to how “games function in broader on- and offline contemporary society as talk-about-able cultural objects for discussion of issues and problems that span far beyond the purview of such games themselves” (Steinkuehler, 2006, p. 100). The size and scope of video games make them culturally vital in a way that reaches far beyond the bounds of any particular game. Video games are meaningful as objects of play, analysis, monetary gain, social interaction, and in a host of other ways tied to their role as cultural objects. Recognizing the full importance of the meaning of games requires looking beyond games themselves and into larger debates about the role of games in society and the function of games in people’s lives. To this end, two examples of how the meaning of games can be seen in practice are discussions of video game addiction and the concept of the “magic circle.”

Discourse about video game addiction is plentiful and rapidly increasing as video games become a more prominent media form. Complete with pitches for treatment centers that feature stories of children and teens whose lives have been overtaken by the games they play (CRC Health Group, 2010) and documentaries about individual failures in the ability to balance video games and a broader life (Stuart, 2010), the discussion of addiction and gaming is a key piece of the meaning of video games. Likely driven by the increased money and time spent on games, concerns about gaming’s role in our lives parallels the moral and social concerns that come with the introduction of almost any media form. Emerging counter-narratives seeking to rearticulate questions of addiction further define the meaning of games. Efforts by gamers to reframe a discourse of addiction and focus on the unbalanced lives of certain individuals attempt to articulate the meaning of games in a manner concordant with video games as a potentially positive force in people’s lives while crafting a way to talk about certain behaviors as “problematic use,” rather than addiction (Nardi, 2010). The debate over whether or not video games are addictive is a key piece of the meaning of games, as we struggle to understand and define the implications of a newer media form.

Beyond the large, social debates about games, the meaning of games is also articulated in smaller disputes, such as the one between games researchers and developers over a concept called the “magic circle.” The notion dates to *Homo Ludens* (Huizinga, [1938] 1950), but was popularized and redefined in *Rules of Play* (Salen & Zimmerman, 2003) where the magic circle was defined as a bounded space for play that was separate from everyday life. The magic circle offers space to engage in experiences disconnected from the features of normal life that could inhibit certain actions within a game. This idea presents a conception of the meaning of games where video games are a distinct, refreshing, and different kind of activity that allow players to divorce themselves from the strictures of their everyday lives. However, many scholars critiqued the concept of a magic circle, arguing that cheating shows a kind of play where any idea of a magic circle breaks down (Consalvo, 2009) and with arguments contending that play consists of the assembly of myriad parts, none of which can be isolated from the others (Taylor, 2009). The criticism eventually led to a response by Zimmerman, who argued that the idea was never intended to create an orthodox, rigid viewpoint and that the idea of a magic circle was largely a tool for game designers (2012). For proponents, a magic circle opens up possibility spaces and promotes open, free-thinking about what games can be. For critics, the concept elides material conditions facing players and analysis of the worlds in which games are played. Regardless of whether or not we always actively consider the role of a magic circle in game development or criticism, these largely internal discussions about games help structure what games are made, how they are played, and how we think about them. The magic circle is not just an idle, academic debate, it is an example of how discussions about how games work shape meaning outside of the bounds of consideration for any specific game.

In presenting opposing views of what games can be, debates about addiction or problematic use and the magic circle illustrate how the meaning of video games can be different things to different people in different contexts. In addition to the larger, social implications of video games as a media form, the meaning of games is shaped through active debates by designers, scholars, and gamers who lay out ideas about how to better understand video games and how connected spaces for play are to everyday life. Complementing this broad notion of the macro understanding of meaning and games is a micro look at the meaning that can be found in games.

Meaning in Games

A seemingly straightforward, but exceptionally rich form of meaning can be found in the games themselves. Although questions of meaning in games does not provide a large, big picture background like the meaning of games, drilling down to specific games and how they are made to mean can offer particular, deep insights about how games work and their potential as a communicative media form. There are several ways of exploring meaning in games, but two powerful lenses for this kind of discussion are procedural rhetoric and the design and play of games in practice.

The notion of procedural rhetoric stems largely from the work of Ian Bogost, who contends that, for video games, “the main representational mode is procedural, rather than verbal” (Bogost, 2006, p. 168) and that when video games make arguments, they “do it not with oral speech, nor in writing, nor even with images. Rather video games make argument with *processes*” (Bogost, 2008, p. 125). In so doing, Bogost seeks the meaning in games by focusing on processes are used to “dictate how actions can and cannot be carried out” (Bogost, 2007, p. 3). This focus on procedures is a strong articulation of how meaning can be found in games, as focus is placed on a particular dynamic of video games and how it creates meaning. By examining games such as *Hush* (Jamie Antonisse and Devon Johnson, 2007), where players are placed in a position of a mother trying to soothe their child in the midst of the Rwandan genocide, Bogost demonstrates a mode of meaning making particular to games, one that is inextricably tied to the dynamics of games themselves and how they function as an expressive media form. Instead of relying on text and images to convey a story, as in a television report, *Hush* conveys information based on interaction with the rule-based systems that govern its computer program. For Bogost, video games are special because of their reliance on procedures, where communication is mediated through a computer program and its use of code. Parsing the processes of a game, much like a rhetorician might critically analyze the words of a speech, offers a clear route to examining the meaning in video games.

This perspective is quite useful, but it needs to be expanded to look at the other ways that meaning resides in games. Beyond the procedures, a broader conception of game design and specific examples of play in practice offer other points where meaning can be found in games. Questions of design stretch outside the code of the game, as part of the meaning in games can be found in how structural elements reach beyond the game's code. An example of this can be seen in *EVE Online* (CCP Games, 2003), where the limited, vague instructions given in the new player experience forces players to either quit the game or seek out information beyond the bounds of the game itself (Paul, 2011a). The end result of *EVE Online*'s design choice is that the meaning within the game is determined by how words in tutorials, coded processes, and a community of players that may or may not aid new players in their effort to learn the game come together to define what the new player experience means. Meaning in *EVE Online* cannot be reduced to any of these parts, as it exists in the interaction of the pieces to form the whole of the game.

Another mode of meaning can be found in the practical play of games themselves. Meaning can be found in the interactions of players, as often the meaning in games is found in play. Motion-based games provide a perfect platform for how to see how play can be a window into the meaning in games. *Wii Sports* (Nintendo, 2006) and *Johann Sebastian Joust* (Die Gute Fabrik, 2011 for the alpha version) are excellent examples of how play can create meaning. *Wii Sports* builds from the previous experience most people have with certain sports to provide a gaming experience that takes off in the playing. As the rapid adoption of the console and its integration into the recreational habits of the elderly drove media coverage, meaning in *Wii Sports* is found in play. The *Wii Sports* version of bowling remade the game in a manner that did not require heaving a heavy ball down a lane, unlocking the potential of the game for a group of people who may have found difficulty with the offline bowling that dominated their recreational habits earlier in life (Paul, 2012). Differently, *Johann Sebastian Joust* takes the folk game *Ninja* into a motion-controlled world by using PlayStation Move controllers and Bach music. In abstract, the game simply requires moving in sync to the tempo of music, but the game takes off in play as players make the game their own. How the game plays out in practice and, by extension, what the game means is determined by the people playing and the environment in which the game is played. The meaning in *Joust* is clarified more in the play of the game than in its processes or design, even though the code of the game sets the table for the meaning that can be found in the interactions of those playing the game. Each group of players recontextualizes the game in accordance to the group with whom they are playing, and the highlight of the game is often when the least assuming player wins because everyone else leaves them alone until the bitter end of the round.

The specific meaning found within games is a crucial part of what they are. Shaped by both the processes of games and the design and play of them, part of the meaning of games resides within them. Beyond the specifics of games and the broader culture that helps determine the meaning of games, communities of players can shape the meaning that can be found around games.

Meaning around Games

The growing population of people playing games leads to a situation where meaning can be found in texts surrounding games. In addition to their role as broad, cultural objects, game communities can give additional, potentially more targeted meaning to the games they play akin to the interpretive communities that can be identified in other forms of textual criticism (Fish, 1980). The meaning in video games can also reach beyond games themselves, as groups of players help recontexutalize what a game is and what may be most meaningful about particular games or genres of games. A rich body of game studies literature focuses on analyzing the cultures that surround video games and supplements complementary work from disciplines such as film studies (Bordwell, 1989). Building from a variety of disciplinary backgrounds, this work often addresses how games are complex objects and how meaning can be developed outside of games. This meaning around games can be seen in the cultural practices of gaming and emergent behaviors of gamers.

Examinations of the cultural practices of gaming and gamers generally come in a few different forms. One perspective on this kind of approach can be found in Mia Consalvo's analysis of cheating, where she demonstrates the many ways that cheating can be defined and analyzes how cheating possesses a contingent definition that is regularly defined and redefined based on the context of play and the gamers doing the playing (2007). In so doing, Consalvo is effectively making arguments about how meaning can be found around games. Although influenced by larger social structures and context, arguments about cheating and the social context in which the term is defined are less about the meaning of games and more of an investigation into the rich culture around games and how meaning making is found in the analysis of what happens on one of the many platforms for analysis that games provide.

Ethnographic studies of games and gamers are also a way to chart how meaning can be found around games. Books by T. L. Taylor about *EverQuest* (Sony Online Entertainment, 1999) (Taylor, 2006) and professional gaming (Taylor, 2012) address the dynamics of the cultures that have emerged around particular games and practices of gaming. Her work about online games details how the games produce large, vibrant cultures where analyzing the processes or play of the video game would only scratch the surface of the rich webs of meaning produced by games such as *EverQuest*. Her work about professional play is similar and analyzes how the professionalization of play intersects with a number of cultural practices and material affordances that parallel existing cultures in sports, music, and business. Both of these books take games as a starting point for analysis, yet frequently find their most salient arguments resting in how meaning can be found around the games and in the practices of power gamers or the stakes and implications of sanctioning certain games for professional competition instead of others.

Meaning around games can also be found in the discursive practices of players and designers. Intersecting with the meaning that can be found in games, meaning around games can stem from the adoption of a term such as “welfare epics” (Paul, 2010), debates over the realism of sports games (Baerg, 2008), or the development of mathematical models such as “theorycraft” and other player-driven practices to optimize game play (Paul, 2011b). These studies take the emergent practices of gamers as a subject for analysis and then leverage the findings from the discourse around games to make arguments about game design and game culture. The emergence and prominent use of the term “welfare epics” offered insight to the reward structure in online games, while the search for realism in simulated *Madden NFL* (EA Tiburon, 1993–present) games gives a fresh perspective on what a sports game is and can be. Finally, the development and mass adoption of theorycraft prompted changes to *World of Warcraft* (Blizzard Entertainment, 2004) that were made to challenge theorycrafters, effectively making theorycrafting a required extra-curricular activity for a large number of players.

Focusing on the larger cultural implication of games or the particular meaning that can be found in a given game leaves out a primary way in which games are meaningful. The meaning around games is a rich location for inquiry where quality investigations often have collateral benefits to understanding the design of games and the cultural role of video games. The growth and popularity of games, in combination with other sociotechnical innovations, creates a culture around gaming that is a substantial factor in how video games are meaningful.

Investigating Meaning

The meaning of video games stretches beyond games themselves into general society and subcultures developed around video games. The meaning of games is typically framed by large cultural implications, as video games have become a massive media industry that is meaningful in terms of its financial and social impact. The meaning of games is connected to their role as cultural objects, where both specific games and games in general are subject to questions of meaning that reach beyond the bounds of what can be found in games or game culture. There is also meaning to be found in particular games. The processes, design, and play of games offer places where meaning can be found and analyzed. The growth of emergent cultures and practices of gamers also means that there is meaning to be found around games, as professional gaming and emergent discursive practices demonstrate how the meaning of games can exist outside of games themselves.

These three types of meaning are not an exclusive list of how games are meaningful. Scholars interested in questions of meaning and games should continue to chart the field of video games and how games are made to mean. These are also categories likely to crop up in combination, as the meaning of particular games is almost always shaped by their cultural context, and cases such as theorycraft demonstrate how the meaning around games can help restructure the meaning in a given game. Leveraging the areas of overlap offers a chance to press deeper and reaches a greater level of understanding about why games and their meanings matter. These three categories are designed as areas of investigation, as places to start looking for and assessing the notable ways and places where meaning can be found. Charting what is found and developing the case studies to articulate why a specific case is interesting, compelling, and/or notable for gamers, designers, and scholars gives all of us a better chance to understand why games matter and how they mean.

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57

ETHICS

Mark Hayse

Armchair philosophers often use the words *ethics* and *morality* interchangeably. Indeed, the overlapping concerns of each word render their meanings ambiguous. Nevertheless, the two words are not coterminous. Often, morality—from the Latin *moralis* or *mores*—refers to particular values and practices in one's personal, social, and cultural life. In contrast, ethics—from the Greek *ethos*—often refers to the systems, methods, and schools of thought by which persons come to determine what is moral and what is not. In other words, morality tends to address the concrete while ethics tends to explore the abstract. Morality frequently presents and recommends a code of conduct. Ethics presents philosophers with a process for the critical and theoretical assessment of moral claims. For the purposes of this discussion, morality will refer to the "what" of values (prescriptive content) while ethics will refer to "how" persons critically assess those values (descriptive process).

Philosophers utilize a wide range of sharply contrasting systems for ethical analysis, as seen in any introductory textbook such as Lawhead's *The Philosophical Journey* (2013). For example, divine command theories situate ethical reflection within a religious context. To divine command theorists (such as William of Ockham), right and wrong are a matter of obeying or disobeying the laws of God. However, ethical relativism opposes divine command theory. The ethical relativist (such as Ruth Benedict) maintains that individuals or societies can determine what is right and wrong in their own eyes. Ethical egoism and utilitarianism also stand in contrast to each other. The ethical egoist (such as Ayn Rand) approaches morality in terms of self-interest, while the utilitarian (such as John Stuart Mill) grounds morality within the greatest good for the greatest number of people. Deontological ethics and virtue ethics present two opposing systems as well. The deontological ethicist (such as Immanuel Kant) argues that morality derives from universal principles that lead all reasonable people to an absolute, moral duty. In contrast, virtue ethics contend that morality is rooted in character, not reason. The virtue theorist (such as Aristotle) believes that moral practices flow from moral character. Feminist ethicists (such as Carol Gilligan) add that morality must also encompass human caring. Video game theorists understand the importance of ethical systems for interpreting the meaning of the gameplay experience (for example McCormick, 2002; Reynolds, 2002).

These ethical systems—and others—also inform video game theory and design (see for example, Schrier & Gibson, 2011). Many theorists and designers recognize that ethical theories can enrich critical reflection upon video game design, content, and players. First, this discussion will consider the effects of video games upon those who play them. Second, this discussion will explore the theory and design of video games for ethical reflection.

Video Game Effects

Toles (1985) wrote one of the earliest critiques of video game effects upon players. In her assessment of one hundred arcade video games, Toles variously refers to them as “addicting,” “mindless,” and “violent” (p. 209). She argues that they reinforce a worldview of social conservatism (p. 214) and xenophobia (p. 222). Toles contends that approximately 90 percent of the games studied also propagate male dominance and female helplessness or irrelevance (p. 214). She also suggests that the games teach subservience to violent and impersonal orders (pp. 214, 217). Interestingly, Toles notes that arcade video games teach not only technological reliance (p. 214) but also the fear of technologically-reliant enemies (pp. 214–217). Toles concludes that arcade video games socialize players into a dangerous, military state of mind: “Video games can be good clean fun. But in a world that lives on the brink of nuclear annihilation from missiles launched from computer-dependent silos, they may be more deadly than we know” (p. 222).

Kinder (1991) and Provenzo (1991) assess the effects of Nintendo Entertainment System video games upon children—particularly males. Kinder contends that video game play encourages “an early accommodation to consumerist values and masculine dominance” (p. 119). She expresses concern that video games tend to feed the fantasies of boys more than girls (p. 103). However, she theorizes that video games can help male children to navigate gendered developmental issues (pp. 101–104). Kinder also maintains that video games can assist all children in their cognitive development (pp. 111–119). Provenzo’s assessment is far less charitable. Throughout his argument, Provenzo argues that video games tend to reduce morality to a good-versus-evil binary that propagates xenophobia, racism, and sexism. In his conclusion, Provenzo briefly addresses the non-neutrality of computer technology as a socializing force: “In the case of Nintendo, the child has almost no possibility to reshape the game and escape its instrumentalist logic. There is literally one path down which the player can proceed” (p. 137). Here, Provenzo suggests that the computational structures and interfaces of video games tend to overwhelm those who play them—a position later developed by Friedman (1999), Manovich (2001), and Galloway (2006).

The representation and frequency of explicit violent and sexual content gradually accelerate throughout the 1970s, 1980s, and 1990s. Exidy’s *Death Race* (1976) sends players on a demolition-derby mission to run over elusive monochromatic pedestrians. The gameplay of *Custer’s Revenge* (Mystique, 1982) and *Leisure Suit Larry in the Land of the Lounge Lizards* (Sierra On-Line, 1987) focus on pixelated rape and seduction, in turn. The fighting game *Double Dragon* (Taito, 1987) incorporates street violence, male-on-female violence, and S&M imagery. *Night Trap* (Digital Pictures, 1992) utilizes full-motion video and live actors in a slumber party stalker/slasher game. *Mortal Kombat* (Midway Games, 1992) revels in gratuitous violence through its notorious fatality blows. Id Software’s *Wolfenstein 3D* (1992) and *DOOM* (1993) move gratuitous violence into the first-person perspective. Many blamed *DOOM*—at least in part—for the Columbine High School massacre in 1999. *Grand Theft Auto* (DMA Design Limited, 1997) launches perhaps the most scandalous video game franchise in terms of violence and sex, including the solicitation and murder of prostitutes. Games such as these often raise public protest (Kent, 2001, pp. 461–480; Arsenault, 2008; Donovan, 2010, pp. 225–235; Gross, 2011).

Under public and federal pressure, the non-profit, self-regulatory Entertainment Software

Rating Board (ESRB) was established in 1994. The ESRB monitors and labels the "frequency, intensity, and severity" of video game content (ESRB, 2013). Of the ESRB's 30 content descriptors, about one-third addresses violence while approximately another third addresses sexuality and vulgarity. Of the 1,218 ratings assigned in 2012, 45 percent of video games were rated E (Everyone), 22 percent were rated E10+ (Everyone 10 years or older), 24 percent were rated T (Teen), and 9 percent were rated M (Mature, 17 years or older). The ESRB claims to assess not only "the most extreme content of the final product" but also "the final product as a whole—demonstrating the game's context (such as setting, storyline and objective) and relative frequency of extreme content." However, the ESRB also acknowledges that raters do not play the games in order to assign ratings. Careful gameplay requires a prohibitively heavy investment of time in order to exhaust the "different permutations" of in-game player choices. Instead, ESRB ratings are assigned based upon materials submitted by their publishers: questionnaires, video files "of all pertinent content," and occasional scripts. Thus, the truncation of the ESRB's review process undermines its capacity to assess the context and nuance of apparently offensive content, at least in part.

In contrast, Jenkins (2000) and Sicart (2009) argue that disputable video game content can exert a moral influence upon players. Jenkins disagrees with those who assert that video game players are largely passive media consumers. He also condemns the kind of "moral panic" that leads to widespread pessimism and fear of video games—a well-documented phenomenon in the United States and Asia (for example, Toles, 1985, p. 210). Instead, he calls for moderation in a debate that often swings to extremes. From Jenkins's perspective, violent video games do not cause players to commit violent acts. Instead, he maintains that players can and do engage in ethical reflection upon the games that they play. More particularly, Jenkins argues that video games functions as a constructive platform for empowerment, self-expression, working through feelings, and meaning making. Similarly, Sicart contends that players filter gameplay through their own moral perspectives. This filtering process depends upon ethical reflection, thus aiding players in the development of critical reasoning skills (2009, pp. 225–226). To Sicart, video game players are "moral creators of values and experiences" and the "ethical co-creators of the ludic experience of computer games" (p. 226). Sicart and Jenkins share the humanist conviction that video gameplay can—and often does—contribute to the ethical development of players.

Jenkins (2005) also insists that not all video game violence is created equal. On one hand, he concedes that early video games relied upon "fairly simpleminded and formulaic representations of violence," functioning as "little more than shooting galleries where players were encouraged to blast everything that moves" (p. 26). On the other hand, Jenkins argues that the more mature medium of today increasingly designs games as "ethical testing grounds," introducing a "moral framework or some notion of consequence into play" (pp. 26–27). To Jenkins, critics and players alike should celebrate video games that elicit meaningful, ethical reflection—whether the content is violent or not. Jenkins's optimism reflects a conviction that engaged players can "develop the skills and vocabulary needed to think more deeply about the violence they encounter in the culture around them" (p. 30).

More recently, Anderson and Warburton (2012; see also Anderson, Gentile, & Buckley, 2007) offer a social-science assessment of video game effects. First, they note the helpful effects of video game play in the arenas of pain management, coordination and spatial cognition, pro-social behavior, education, and exercise (pp. 57–59). However, the bulk of their assessment focuses on the harmful effects of video game play—particularly violent video game play. Anderson and Warburton note that approximately 10 percent of video game players in the US, Europe, Singapore, and China do so at pathological levels. They suggest a causal link between video game and attention deficits, poorer school performance, and various forms of increased aggression (pp. 59–61). Anderson and Warburton attribute these effects to particular features of violent video game play, such as the imitation of violent acts, identification with violent characters, repetition of violent behaviors, interactivity, a lack of negative in-game consequences, associative learning, and the acquisition of aggressive "scripts" (pp. 69–74). Nevertheless, Anderson and Warburton concede that media violence—including video game violence—does not deserve blame as a singular or most important source of violent behavior (p. 62).

Ethical Video Game Design in Ultima IV: Quest of the Avatar

Current developments in video game design for ethical reflection stand upon the shoulders of Richard Garriott's *Ultima IV: Quest of the Avatar* (Origin Systems, 1985). Its design is clear and straightforward, rendering it useful for analysis. Numerous writers assert that *Ultima IV* is the first "to use gameplay as a means to build a story and a message with philosophical and ethical implications" (Mäyrä, 2008, p. 82; see also Herz, 1997; Wolf, 2001; King & Borland, 2003; Barton, 2008; Brown, 2008). For example, *Ultima IV* generates the avatar character in the player's own moral image, after the player responds to a series of seven ethical dilemmas. Garriott deploys this strategy in order to facilitate an intimate identification between the player and the avatar (Herz, 1997, p. 157). In contrast to other video games of the day, *Ultima IV* incorporates—but subverts—the conventional "hack and slash" mechanic by relocating gameplay with a deeper, more personal quest to embody eight virtues within the kingdom of Britannia. *Ultima IV* monitors player progress in the eight virtues via an "internal karma counter" that invisibly tracks the avatar's moral progression and regression (Spector, 1992, pp. 369–370). Hayse describes this system as a transactional "moral economy" (2009, pp. 140–142; see also 2010, pp. 35–38). *Ultima IV* allows for 20 transactions within its moral economy, most of which hinge upon the avatar's relationships to others: three toward the natural world, nine toward the citizenry, and six toward one's enemies (Hayse, 2009, p. 137). Through this moral economy, Garriott clearly intends that *Ultima IV's* design should elicit ethical reflection from the player upon matters of moral importance (Addams, 1990, pp. 40–42; Spector, 1992, p. 370; Bauman & Garriott, 1999; Bub, 2002).

Myers (2003) argues that video game design for ethical reflection is difficult, if not impossible. He contends that backstories, narratives, and moral frameworks are superfluous to video game play. To Myers, these elements "neither motivate nor confine" the meaning-making activity of the player. He insists that they are "irrelevant to action game play, misleading of role-playing game play, and destructive to strategy game play." In Myers deconstruction of the *Ultima* series, he argues that players care more about winning games than reflecting upon their moral meaning. In other words, Myers contends that the *ludic* (or game) nature of the video game medium undermines any potential ethical insights gained through gameplay (see also, Mäyrä, 2008, pp. 85–86). In one sense, Myers is correct. Backstories may not meaningfully inform video game play for those oriented toward achievement or the other ends of Bartle's taxonomy (1996). However, it is wrong to assume that backstories, narratives, and moral frameworks can not meaningfully inform any video gameplay experiences at all. Indeed, Mäyrä notes that for some players, their experience with *Ultima IV* was "transformative in their personal gaming histories" (2008, p. 86). For example, DeMaria and Wilson (2004) report the testimony of one player who experienced *Ultima VI: The False Prophet* as a meaningful tale of cultural and racial reconciliation:

> In *Ultimas V* and *VI*, Garriott created a fearsome race of creatures called the Gargoyles. Throughout these games, you fought and killed them when you could, feeling good that you were ridding the land of a terrible enemy. But, by the end of *Ultima VI*, you discovered that the Gargoyles were really very civilized, and that you had been systematically, if unknowingly, destroying their world. To me, this is one of the most brilliant moments in computer game history, where I was given the opportunity to come face-to-face with my own ability to create prejudice, and how ignorance can create false impressions.
>
> (p. 122)

Ultima IV's moral economy establishes the conditions within which players can reflect upon their own values as well as the value system of the game. At least for some players, one's own identity impinges upon the ethical tensions of *Ultima IV*. This is what Gee describes as a "projective identity"—a projection of one's self upon the avatar, and a sense of the avatar as "a project in the making" (2007, pp. 48–63). If Gee is correct, then the *Ultima IV* player asks not only, "What should the *Avatar* do?" but also "What do *I* really believe?" Social-science research appears to support Gee's point (for example, Griffin, 2007).

Ultima IV also deploys the strategies of dilemma and paradox in order to elicit ethical reflection. As the game progresses, the avatar comes to know that moral perfection demands not only valor and justice but also compassion and sacrifice. This confronts the player with a dilemma that juxtaposes the imperatives to kill one's enemies, to earn experience points, and to gain gold pieces against the imperative to show mercy. The player begins to wonder: How can I achieve perfection both valor and compassion at the same time? It seems that when I show mercy, my valor diminishes. When I slay my enemies, my compassion diminishes. And what is justice? Is it just to execute a lawless offender, or is it just to show mercy? On what ethical basis am I to determine what is moral? The player already anticipates tensions such as these because of the series of seven ethical dilemmas that the player has already addressed during the game's introductory sequence. The feedback mechanisms of *Ultima IV* offer but a measure of ethical guidance—infrequent and oblique. The moral consequences of the avatar's behavior are often difficult to discern. The karma counter remains forever hidden from view as the player wrestles with the process of ethical reflection.

Thus, *Ultima IV's* design for ethical reflection hinges upon its opacity—a quality often missing from more recent games that seek to incorporate an ethical dimension. Most video games conceal important information from players as the game begins, such as playing fields, artifacts, and quests. In addition to these, *Ultima IV* also conceals the moral economy from the player. The screen display prominently features the character's name, gender, class, and friends. Health points, experience points, magic points, and food units, and inventory items appear as well. However, the screen display says nothing about virtue—the heart and soul of gameplay. In fact, *Ultima IV* never provides direct statistical feedback concerning the avatar's progress in the eight virtues. Narrative feedback from the residents of Britannia is infrequent and indirect at best. Thus, the player can only gradually discover the path to virtue through trial, error, and discernment. Hayse describes this experience as a process of "unfolding revelation" from the designer to the player (2009, pp. 146–156; see also 2010, pp. 38–41). Ethical reflection arises within the tension between *Ultima IV*'s moral economy and its unfolding revelation—a tension that seems to hold diverse elements of both virtue ethics (the player's moral center) and divine command theory (Garriott's moral economy) in a precarious balance. Bogost describes this tension between the known and the unknown as a "possibility space" (2006, p. 85) within which players engage in "self-reflection, debate, dispute, and a host of other contentious activities" (p. 122). Garriott's great innovation is not only the invention of a moral economy, but also its integration with the process of unfolding revelation. Of course, video game opacity can sometimes foster frustration within a player, even though the skillful deployment of opacity can elicit critical reflection. It is worth noting that Garriott decreases the opacity of his moral economy in *Ultima V: Warriors of Destiny* (Origin Systems, 1988). In that game, the player can hit "Ctrl-K" at any time in order to read a visual display of the karma counter. This decreased opacity reduces the need for critical reflection. Nevertheless, Garriott still deploys opacity through the unfolding revelation of *Ultima V*'s narrative. In any case, the skillful deployment of opacity can elicit critical reflection. The quest for wisdom and insight is a hallmark of the good life (MacIntyre, 2007, p. 219) as well as a good game—a quality that elevates *Ultima IV: Quest of the Avatar* to a time-honored place in the video game canon.

Ethical Video Game Design after Ultima IV: Quest of the Avatar

A host of other video games stands alongside *Ultima IV* as notable examples that frame play within a moral economy. The work of Peter Molyneux first comes to mind. In his *Populous* and *Black & White* series, Molyneux explores ethical consequentialism through god games that simulate divine action and human response. Molyneux's work in ethical consequentialism continues through his *Fable* series. Fantasy and science-fiction role-playing games such as *The Elder Scrolls: Arena* (Bethesda Softworks, 1994), *Fallout* (Interplay, 1997), *Baldur's Gate* (BioWare, 1998), *Deus Ex* (Ion Storm, 2000), *Star Wars: Knights of the Old Republic* (BioWare, 2003), *Bioshock* (2K Games, 2007), Mass *Effect* (BioWare, 2007), and *Dragon Age: Origins* (BioWare, 2009) have each launched franchises that feature overt moral economies. Typically, these franchises seek to elicit ethical reflection through explicit structures such as alignment matrices, reputation systems, decision trees, and branching narratives. However, critics argue that many of these games—though not all—tend to present players with simplistic choices that are easy to manipulate toward a ludic end (Sicart, 2009; Stevenson, 2011; Schrieber, Cash, & Hughes, 2011). Melenson (2011) places the blame for this at the feet of the "moral axis." He argues that the moral axis creates a false dichotomy of good and evil, treating morality as a zero-sum game in which good points accrued can eliminate evil points accrued. Melenson also criticizes the tendency of any moral axis to reflect its designer's moral bias, as well as its inadequacy for the assessment of player intentions. Melenson wants to relocate the ethical and moral dimensions of video gameplay within storytelling and the artificial consciences of individual non-player characters—something he observes within *Dragon Age: Origins*.

Other critics note that the ethical depth of a video game increases through the deployment of chronological opacity. In Zagal's (2011) discussion of *Chrono Trigger* (Square, 1999), he explains that when the protagonist faces trial, witnesses appear who noticed him at an earlier festival in the game. Zagal writes: "As the trial unfolds, the player is often shocked to realize that the things he did earlier reflect his moral character" (p. 22). Schrieber, Cash, and Hughes similarly argue that the horror game *The Suffering* (Surreal Software, 2004) provides "permanence to the player's decisions" (2011, pp. 77–78) through time delay. Throughout gameplay, the player can turn into a monster in order to win combat. However, frequent use of this ability increases the chance that the player kills his wife in a blind rage—an event that remains hidden until the end of the game. In Sicart's analysis of *Metal Gear Solid 3: Snake Eater* (Konami Computer Entertainment Japan, 2004), he notes that the game encourages stealth. If a player chooses violence instead, the game progresses more slowly. Sicart explains that eventually, the protagonist must "walk up the river, against the stream of all those he has (or we players have) needlessly killed" (2009, p. 107). Sicart argues that this sequence "is one of the most accomplished translations of the ethical possibilities of games into actual game design" (p. 108; see also Zagal, 2011, pp. 22–23). Stevenson observes that in both *Shadow of the Colossus* (Team Ico, 2005) and *The Witcher* (CD Projekt RED Sp. z o. o., 2007), player actions later turn out to cause unforeseen moral ripple effects. *Shadow of the Colossus* accomplishes this through "dramatic irony" and "sudden narrative serve or reveal" without "sermonizing or being openly reproachful toward the player" (2011, p. 39). In *The Witcher*, the consequences of player actions play out hours later, thus restricting the utility of saving and reloading in order to engineer the most favorable outcomes. This effectively confronts the player with moral repercussions that elicit ethical reflection.

Conclusion

Bogost argues that relatively few video games present moral complexities sufficient to elicit critical, ethical reflection (2007, pp. 286–287)—an insight shared by others (Fitzpatrick, Walsh, & Nitsche, 2005). Thus, ethical video game design continues to press boundaries at the edge of game development. Violent and sexual content alone are not morally culpable. Through careful design, even the suspect elements within video game play can foster ethical reflection and mediate moral meaning. In order to attain this worthy end, video games must leverage the power of the moral economy, ethical dilemmas that surpass merely contrasting choices, the uneasiness of paradox, and a careful balance between consequence, feedback, and opacity.

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58

NARRATOLOGY

Dominic Arsenault

While the study of storytelling techniques in the Western world dates back to Aristotle's *Poetics*, the term "narratology" itself appeared in the 1960s, as an important part of French structuralism. This movement was a paradigm shift more than a single and precise theory, and centered on the belief that the structuring elements and relationships that bind semantic units together form a superstructure of meaning, which must be studied if we are to really understand the events and objects that are spawned through this structure. Given how games remain a process that unfolds from a core structure of rules, structuralism made the connection between game and narrative all the more visible. In the 1966 issue of *Communications*—which Marie-Laure Ryan refers to as the "birthday of narratology" (Ryan, 2006, p. 3)—Roland Barthes made a quite explicit statement in this regard:

> [A] great many narratives set up two opponents at odds with each other over the possession of a stake … This "dual" is all the more interesting because it points out the affinity between narrative and the structure of certain (quite modern) games in which two equal opponents set out to conquer an object placed in circulation by a referee. This scheme recalls the actantial matrix proposed by Greimas, an analogy that is not surprising if one pauses to realize that play, considered as a language, possesses the same symbolic structure as that found in language and narrative.
>
> (Barthes, [1966] 1975, p. 259)

This duel (as the original French reads, rather than *dual*) of equal opponents harkens back to Roger Caillois's *agôn* category identified in *Man, Play and Games* (Caillois, [1958] 1961), and highlights the importance of conflict as a component of narrative. As H. Porter Abbott wrote in the *Cambridge Introduction to Narrative*:

> [I]n almost every narrative of any interest, there is a conflict in which power is at stake. You might say that conflict structures narrative. The ancient Greek word for conflict (actually "contest" is closer) is *agon*, and how the *agon* played out formed the spine of any Greek tragedy.
>
> (Abbott, [1993] 2002, p. 55)

Thus, understanding how conflict structures the agonistic forces at work throughout a narrative brings something of a game-like quality to it.

The Boiling Point: Ludology and Narratology

The structuralist connection between narrative and games has been one of the entry points in the formation of ludology (in the broadest sense of a "discipline that studies game and play activities," as put forth by Frasca, 1999). In 1997, Espen Aarseth's *Cybertext* and Janet Murray's *Hamlet on the Holodeck* offered two opposed viewpoints on the issue of narrative and textuality. For Aarseth, the fundamental differences between narratives and games required that researchers develop novel frameworks and methods for studying the latter; for Murray, the computer as a medium and the principles of interactivity (including video games) were hinting at new narrative forms and modes, with a potential yet to be charted out. The table was set for the first debate of the nascent field of game studies, opposing narratology and ludology. While narratology was singled out as an example, the debate more broadly concerned the appropriateness of studying games by applying pre-existing theories and approaches, or by devising novel, specific conceptual tools. The debate did not last long, and was in fact repudiated by both "parties" as a non-event. Janet Murray remarked: "The ludology vs narratology argument can never be resolved because one group of people is defining both sides of it. The 'ludologists' are debating a phantom of their own creation" (Murray, 2005, p. 3), echoing Gonzalo Frasca's previous interrogation: "Who are the narrativists?" (Frasca, 2003).

It appears the whole ludology vs narratology "debate" may have been overblown by Markku Eskelinen's oft-cited hyperbolic (and provocative) claim: "Outside academic theory people are usually excellent at making distinctions between narrative, drama and games. If I throw a ball at you I don't expect you to drop it and wait until it starts telling stories" (Eskelinen, 2001). Rune Klevjer extrapolated a position of "radical ludology" from this statement, to the effect that "everything other than the pure game mechanics of a computer game is essentially alien to its true aesthetic form" (Klevjer, 2002, pp. 191–192). While Eskelinen's particular phrasing indeed appears excessive, most writings from both camps (the self-identified ludologists, and researchers vaguely defined by others as narratologists or narrativists) were a lot less polemical. Consider Celia Pearce's call for a reworking of the definitions and tools of narrative theories so that they can account for the specificity of games:

> It is very important to understand that narrative has a profoundly different function in games than it does in other narrative-based media.… although there is much to be learned from traditional narratives, and a great value in drawing comparisons between the two, without understanding the fundamental differences, the discourse becomes ultimately irrelevant because it entirely misses the fundamental point of what games are about.
>
> (Pearce, 2004, p. 144)

Though Frasca (2003) implicitly includes Pearce among the "narrativists," in the end, her position does not appear too far away from Frasca's own call for identifying the specificities of games. The difference resides in whether narrative constitutes a worthwhile analytical frame, or if some other approach should be privileged:

> [T]he real issue here is not if games are narratives or not, but if we can really expand our knowledge on games by taking whichever route we follow. So far, I am convinced that we should privilege other forms of representing reality, such as simulation, which are

more coherent with the characteristics of games.

(Frasca, 2003)

The contrast between these positions is much more reasonable than an all-out "theory war," to echo Pearce's 2005 follow-up.

Making Sense of the Overlap

Both narrativists and ludologists agree with Aarseth's initial contention that "[t]o claim that there is no difference between games and narratives is to ignore essential qualities of both categories" (Aarseth, 1997, p. 5). All in all, it appears the second part of this quote is needed as much as the first: "the difference [between games and narratives] is not clear-cut, and there is significant overlap between the two" (Aarseth, 1997, p. 5).

It is worth keeping the structuralist roots of narratology in mind when considering the utility and history of this discipline for video game studies. The focus on unearthing underlying structural principles of regularity is common to both structuralist narratology and the video game player's experience: after all, one of the primary tasks which the gamer faces when engaging in gameplay is to build a mental image of the procedural computing process that is working to make the video game manifest (Arsenault and Perron, 2008). This fascination for underlying structural elements also characterized the study of narrative in game studies. Early theoretical inquiries aimed at uncovering game-like properties of narrative in the vein of Barthes' initial structuralist claim. Arguing that "game designers are much less interested in telling a story than in creating a compelling framework for play," Celia Pearce opted to "look at narrative in a play-centric context" (Pearce, 2004, p. 144) and remarked that "certain story genres are more innately gamelike to begin with," citing examples such as "mysteries, mission or goal-based adventures, or combat scenarios" and "the world-based narrative" (Pearce, 2004, p. 153). Marie-Laure Ryan, arguably the person to have written the most on narrative and fiction in games to this day, has also used the video game as a new stepping stone or vantage point from which the central notions of story, plot, narrative, character, temporality, and fictional world can all be re-examined and redefined (see Ryan, 2001, 2004, and 2006, among others).

These studies reflect the shift that happened in the study of narrative as well, as the structuralist roots of narratology gave way to post-structuralist narratology in the 1980s. Rather than reducing the apparent divergences among narratives in quest for a single, unitary structure, post-structuralist narratology embraced the complexity of narrative across modes, media, and genres. Ultimately, narratology branched out to a plurality of other fields in what David Herman called "post-classical narratology": "No longer designating just a subfield of structuralist literary theory, narratology can now be used to refer to any principled approach to the study of narratively organized discourse, literary, historiographical, conversational, filmic, or other" (Herman, 1999, p. 27). Through this change of perspective, games can be studied from a narrative standpoint by examining how they renew, complicate, or transform our understanding of what a narrative is, and of how narration can operate. For example, in many Japanese role-playing games from the 1980s and 1990s such as *Final Fantasy* (Square, 1987) *or Dragon Warrior* (Chunsoft, 1986), the player moves his party through towns and dungeons, but also on an "overworld map." While the characters are represented identically in both instances, the scale of the game-world is very different: Brecconary Town and Tantagel Castle may be only seven steps apart on the overworld map, but those steps do not, in fact, represent the same kind of space-time travel as taking seven steps in the town square or in the castle. Every step the player-character takes on the overworld map results in the game effectively employing the visual channel of communication to narrate a summary of a journey through the lands, through manipulation of that fictional world's spacetime continuum. Hence, Jesper Juul can reconcile the storytelling aspects of video game play through recourse to fiction instead of narrative, which allows a modular conceptualization of the video game playing activity depending on a given player's particular interest:

> That many fictional game worlds are incoherent does not mean that video games are dysfunctional providers of fiction, but that they project fictional worlds in their own flickering, provisional, and optional way. Of all cultural forms that project fictional worlds, the video game is a special form in which players can meaningfully engage with the game even while refusing to imagine the world that the game projects--the rules of a game are often sufficient to keep the player's interest. Perhaps this places games on par with songs, opera, and ballet.
>
> (Juul, 2005, p. 200)

This accounting for the player's desire is a cornerstone of Roger Odin's semio-pragmatic model of fiction (Odin, 2000), in which one produces an imaginary text from a string of signifiers provided by an object, and that depends on the mode of reading that is privileged by a given subject, one of these modes being, naturally, that of fictionalization. Some players may like narratively-heavy games such as *Metal Gear Solid* (Konami, 1998), *Heavy Rain* (Quantic Dream, 2010), or *Dragon Age: Origins* (BioWare, 2011), because of their strong emphasis on storytelling; other players may not like them for the very same reason; and yet some other players may still like them *despite* these storytelling ambitions.

Extrinsic Narrativity: Story Contents

The optional nature of the video game narrative legitimizes from the outset a certain type of study: narrative semiotics (which film narratologist André Gaudreault dubbed the "narratology of content") that "privileges the study of narrative content (the story told), *entirely independently* of the medium through which it is recounted" (Gaudreault, 2009, p. 30). The other "school" of narratology, distinct from the first (though the two are always intertwined), is the "narratology of expression," characterized by the fact that

> narrative expression (the discourse of telling), for this school, is more important than the content […] The principal concern here is the means of expression […] by which a piece of information is communicated to the auditor.
>
> (Gaudreault, 2009, p. 30)

Out of this double helix of narratology, Gaudreault infers two types of narrativity:

> We might call one kind of narrative *extrinsic*: it deals solely with *narrative content*,

> independent of its means of expression. The other kind could be called *intrinsic* narrativity in that its narrative quality derives directly from the means of expression.
>
> (Gaudreault, 2009, p. 31)

These two types of narrativity have wildly different implications and importance in the field of game studies. As Henry Jenkins (2004) and I (2008, pp. 29–33) pointed out, it is a fact that some video games include a story and expend great effort to make it the most important point of the experience they offer, while others feature a very limited story (or even better, no story at all). While it is certainly feasible to study select stories or some narrative figures and tropes, in and of themselves, rather than the means by which they are put into play by the unique properties of the video game, doing so tells us nothing about games themselves, as Herman and Vervaeck's statement illustrates:

> [I]t is the way in which a story is narrated that turns it into what it is. Those who insist on denying the importance of the method of narration by reducing a story to content might just as well go to the movies or watch television because both of them can offer similar content.
>
> (2005, p. 7)

Incidentally, not much academic work has followed this path: by and large, it is rather video game criticism that addresses the narrative contents of games, such as plot twists, narrative inconsistencies, rhythm, script and writing quality of games, and which sometimes offers insights of a theoretical nature.

That video games can serve as a host medium for extrinsic narrativity (by way of adapting already-existing narratives for the medium, for instance) does not say much of the video game's narrative potential in itself; if some games feature extensive storytelling while others have none at all, then the relationship between games and narratives can be seen as contingent and arbitrary, and the presence of a narrative is wholly incidental to whether something can be called a game or not, as Jesper Juul remarked (2005, p. 13). This is why in many game genres, narrative plays second fiddle to gameplay. For instance, many shooters, fighting, and action games feature stories whose sole purpose is to justify a diverse array of levels, enemies and obstacles to be tackled. And yet, to have narrative not be the main focus of the play experience is not a reason to either discredit the study of narrative, or to discredit the narratives found in games themselves. The ludological line of thought rightly stated that narrative *need* not be the central, privileged subject of game studies. A constructive reply would be that gameplay *need* not be the *only* subject of game studies, and that perhaps this "gameplay" word is, in itself, a handy construct that conflates a myriad of different features (point of view, physical interaction, spatial exploration, constant cognitive reframings, etc.) that can in reality only be understood by cross-disciplinary examination from related fields.

That being said, a number of useful studies can be undertaken to examine how the extrinsic narrative elements brought into games can contribute to the game system, or to the player's gameplay activity. Rune Klevjer's short paper "In Defense of Cut-Scenes" (2002), for example, argues that while no relationship of necessity binds narrative to games, the framing narrative still plays an important role in the game experience; this also includes the cut-scene, a moment of non-interactive narrative development that performs a number of gameplay functions such as establishing rhythm, building tension and suspense, and acting as a reward for player progression.

Story Structures

By and large, the most common research conducted on narrative content in games so far has focused on the narrative structures or topologies of games, in an attempt to identify the recurrent ways in which interactivity can gate or deploy narrativity and vice versa. These studies forego the semantic contents of game narratives to examine the syntactic structuring of these narrative entities and events. Structures of interactive narrative could easily fill entire books, but it is possible to provide a brief overview of the key recurring figures identified across multiple sources (Phelps, 1996; Samsel and Wimberley, 1998; Ryan, 2001, pp. 246–258; DeMarle, 2006; Chandler, 2007, pp. 101–115). All structures of interactive narrative provide ways to balance the usual conflicting demands of story and game. These structures may be placed at any point on an axis between two poles, which Chandler identifies as logocentric design and mythocentric design: “Logocentric design is linear and controlled and has been plotted out and documented by the designer” (Chandler, 2007, p. 102), while

> mythocentric design is wide-open and free-ranging and consists of arenas for player action that have been created by the developers. The player, as author of the core experience, gets to choose the goals and means of the game experience. Unlike logocentric design, the developers are facilitators, not creators, of the events that transpire.
>
> (Chandler, 2007, p. 108)

The two approaches could be contrasted by comparing *Heavy Rain*’s heavily pre-scripted (even if it has branching storylines) narrative with *The Sims* (Maxis, 2000) and the emergent narrative that arises out of the interactions of its rules, objects, and player decisions. In their most basic dimension, the structures allow different ranges of player freedom while maintaining narrative coherence, and the importance given to one or the other will determine their position on the *logos/mythos* axis.

It is important to realize that structures of interactive narrative should always be taken as approximate types and general schemata, rather than exact transcriptions of actual game narratives; while many researchers, game designers, and writers may elaborate theoretical story structures out of general principles or typical cases, and even offer some limited examples to demonstrate their models, almost any game examined in its entirety will feature multiple narrative structures over the course of its ergodic traversal (Aarseth, 1997). “Sandbox” games such as *Grand Theft Auto III* (Rockstar North, 2001) typically combine moments of logocentric design, expressed through their linear story missions, with mythocentric design, present in the free-roaming nature of their game environments in between missions. This relativistic stance is also made necessary by practical realities: the game’s structures can rarely be empirically verified for consistency, as this would require access to production documents, source code analysis, and extensive testing to confirm that no unintended behaviors can emerge out of the game system; moreover, even short and relatively straightforward narratives can seldom be charted out in their entirety without arriving at unusable (and often undecipherable) packs of nodes and links crisscrossing wildly.

The baseline, unmarked structure out of which alternatives can be envisioned is the *linear* narrative (Phelps, 1996), which progresses from one textual unit to the next with no variation between different experiences. Mary DeMarle (2006) introduces the idea of the *gated story* (equivalent to Phelps's *interactive* structure) to illustrate how some games integrate interactivity into an otherwise linear narrative: the player is free to play around and experience a range of different minor game-events in-between the sequential, important story-events. In practice, very few games can be said to be entirely linear. Even *Dragon's Lair* (Advanced Microcomputer Systems, 1983), the quintessential full-motion video game in which the player must perform quick time events (as they would come to be called much later) to simply keep the film rolling, adds challenges randomly from a select pool of possibilities. Any game in which the player can freely explore his/her surroundings is bound to contain some minor events that can take place between story points.

Marie-Laure Ryan's *vector with side branches* features a linear "main plot," out of which the player can venture into a side-quest a couple of nodes deep before returning to the same point in the main quest. Slightly moving away from the *logos* pole, we find Ryan's *tree* structure, in which the player makes decisions at key choice points that spin the narrative in a different direction. By itself, this principle is not sustainable: if the player can make a choice between two possibilities only 8 times through his experience, 256 theoretical possibilities have to be planned for. This is why such narratives will quickly collapse and fold back some of the choices into a common path, a structure christened by Phelps as the *braided multi-linear story*. In *Fahrenheit/Indigo Prophecy* (Quantic Dream, 2005), detective Carla must retrieve a tape from the dark and densely-packed archive room, even though she suffers from claustrophobia. The player must control her breathing to keep calm and carry on the task. If the player fails, then the story continues and it is Carla's partner Tyler who will retrieve the tape instead in the next chapter, so that by that time both possibilities fold back together.

The narrative structures more closely associated with mythocentric design proceed from the figure of the network rather than that of the tree; in a network, the player is free to go back and forth through the game's topological structure in order to explore previously unexplored nodes and links, as is typically the case in adventure and role-playing games. As can be gleaned from this short sampling of structures, the study of extrinsic narrative is largely associated with game design and criticism.

Intrinsic Narrativity: Actions Speak Louder Than Words

Turning to intrinsic narrativity brings about a change in both scope and focus. Now the idea is not to examine how clearly identified narrative strategies, deployed in some delimitated subset of video games, are used or contribute to the total sum of its parts, but rather to unearth some deep-running connection making narrative an essential part of the gameplay activity. This question ties into the video game's specificity amongst ludic practices, for how could we consider a form of intrinsic narrativity for video games and not for other traditional, classical games or sports, without positing that they present some unique properties that are more narrative-prone? As such, it has consisted so far, and still remains, at the core of game studies, from Juul's exposition of a "classic game model" (Juul, 2005), which video games move away from on a number of counts, including a stronger focus on fictional elements, to Jenkins's resort to "environmental storytelling" (2004) as a way of accounting for the alternative means of providing narrative contents through spatial exploration and enactment of actions during gameplay.

For now, we can only envision a general direction that further research could take. The video game narrative was alluded to by Rune Klevjer when he stated that the actions which players perform when playing games are symbolic, holding meanings preconfigured by another entity (the game's authorial instance), so that "my own actions speak to me in a voice which is not mine" (Klevjer, 2002). The player-characters we guide through the fictional worlds of video games, and who we routinely identify with to the point of referring to the actions they perform as *our* actions, never cease to surprise us, whether it is Duke Nukem expressing a sudden burst of machismo or Ezio Auditore using an unexpectedly brutal assassination move against his target. A narratological conception of the video game can be erected if the video game play activity is envisioned as a refinement, through real-time image processing, of the same interactive process that governs the playing of text adventures or interactive fiction, and more largely, of tabletop role-playing games in general. Video game narration occurs when the algorithm, acting as a Game Master in role-playing games, orders the events and relays the effects of actions and current state of the fictional world through visual semiotics. While video games are perfectly capable of upholding extrinsic, embedded narratives by emulating cinematographic or literary techniques, the player's actions can be intrinsically narrativized by a fictionalizing player, given that they hinge on the same elements that are central to action theory. By situating themselves at the confluence of games and visual media, video games draw on both of these traditions and lend themselves to the discursive organization of elements at which narrative excels.

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59

ONTOLOGY

Espen Aarseth

In game studies, ontology is the study of the nature of games: their mode of being or existence, and of variation within their domain. However, this is vastly complicated by the fact that game studies is constituted of a great variety of methodological and disciplinary approaches, many of which do not study the same type of phenomenon (e.g. an ethnographic vs. a technological approach). So the preliminary steps of any game ontology must be to first establish a meta-ontology (or more precisely, a meta-game-ontology), and then place itself within it. Since a comprehensive list of approaches (and due discussions of these) would demand much more space than can be allocated here, this approach will be fairly general, with many omissions and simplifications.

The term *ontology* may refer to the general study of being and existence, or a particular theory of being and existence, but also to the meaning used in computer science, that of a formal mapping of an empirical domain (e.g., a railroad system), and the construction and use of such descriptions in implementing simulation—or control-software that accurately models behaviors, objects, and their relations within this domain. Game ontologies can have similar motivations: they can be highly specific formal models of the design space of games, or they can try to answer the general questions: What are games? What do they consist of? Where are they in relation to similar phenomena? Thus, we have at least two different types of game ontologies: (1) Formal or descriptive ontologies, asking what are the functional characteristics and components of game objects, and the relations between them; and (2) existential ontologies asking what are games and what *kind* of existence does a game have.

Both types of ontologies presume that games exist, but neither is dependent on a formal definition of the concept of game in order to be meaningful. So the question of whether it is possible to define the category of games formally, introduced and answered in the negative by Wittgenstein (1953) and challenged (Suits, 1978) but never refuted, need not concern us here. “Games,” like “texts” and “planets,” is a historical term and not a scientific one, and trying to change it into a theoretical term would probably do more harm than good, were it to succeed. As Wittgenstein pointed out, we can still talk about games successfully without a definition, and, let me add, we can still describe games through formal models. The only risk is the possibility that we also will describe things that probably are not games, but this overproductivity matters not as long as the models convincingly describe the phenomena people call games.

The most basic ontological concern regarding games is whether the word refers to an object or a process. Games are both object and process (a combination of states not dissimilar to the duality of language: langue/parole, paradigm/syntagm etc.), but the phrase “a game” will refer to either one or the other, not both. In most contexts, “I bought a game” refers to an object and “I watched a game” refers to a process, and we are seldom if ever in doubt as to which refers to what. But without a specific empirical context, however, as when game researchers from different disciplines meet and use the word “game,” the exact sense being used can be hard to determine, and pseudo-disagreements often occur. The reason is that some game disciplines, for instance game psychology, have a process as their primary focus, while others, such as aesthetic approaches, have an object, and no one realizes that the other is speaking about a different type of phenomenon.

In games studies, additional focal bifurcations exist: within the object perspective there can be a focus on the game as artwork (commodity or artifact) vs. the game as system; and both the object-centered and process-centered approaches can be divided into normative and descriptive: those who try to improve the studied phenomenon (better games, or better lives) and those who merely try to understand it.

A third complication may occur when a language is used that does not distinguish between “game” and “play” but uses the same word for both. Thus, the original versions of Wittgenstein (German), Huizinga (Dutch), and Caillois (French) use the same word for game and play, and it is up to their translators to decide which one to use. Roger Caillois ([1958] 1961) seems to offer a remedy for this in his distinction between *ludus* and *paidia*, but in doing so he changes the original Latin and Greek semantics of these words with rather unfortunate consequences, since outside his book the words still refer to historical practices not compatible with his more restricted meanings, such as the *Ludi Romani*. The famous Roman festival games typically contained both rigid and free gameplay, and so the word “ludus” cannot be reduced to Caillois’s restrictive meaning without simultaneously ignoring one of the most influential play cultures in history.

Formal Game Ontology

Although Johan Huizinga ([1938] 1955) is generally recognized as the instigator of modern studies of *play*, Caillois ([1958] 1961) should be given credit for being the first to attempt an ontological study of *games*. While Wittgenstein’s contemporary observation that games cannot be formally defined is a more fundamental insight (1953), Caillois attempted to create a structural model from which we can describe game genres not by their physical attributes and material practices but by their mental aspects. What for Wittgenstein is primarily a very useful example for the philosophy of language, is for Caillois a unique and separate empirical field of “infinite variety” ([1958] 1961, p. 11) for cultural research, and as such it is in need of its own system of classification and categorization. Caillois’s system is a two-dimensional grid where one axis is a dialectical continuum between the aforementioned *paida* (turbulent, unrestrained, childlike play) and *ludus* (goal-oriented, methodical, rule-regulated play), and the other consists of the four main categories *agôn* (competitive), *alea* (chance-based), *ilinx* (vertiginous), and *mimicry* (play-acting). Naturally, Caillois’s influential description has been met with numerous rewritings (and misinterpretations), critiques and alternatives, but remains highly resilient after more than five decades. We can also see echoes of similar and earlier dichotomies in the *paidia* / *ludus* pair: Schiller’s ([1795] 1957) *naive* and *sentimental* (the direct, natural vs. the reflective and modern), and, as pointed out by Dan Dixon (2009), Nietzsche's *Dionysian* and *Apollonian*. A later parallel can be found in Michael Apter's reversal theory (1989), which includes the two opposed modes *telic* (goal-oriented) and *paratelic* (playful, now-oriented).

A final delimitation of game ontology can be to describe what it is not, but which constitute nearby or complementary areas of game research. The most obvious limitation of an ontology is that it must be descriptive rather than prescriptive, objective rather than normative. Any approach that is focused on changing the world may (and should) still have an ontology as its basis, but it can only contribute to ontology as a side-effect since its main target must be what does not yet exist. If we add to this the main different foci of game research, that of game as artwork, game as system, and game as player activity, we get a six-field table (Figure 59.1).

Most game research can be placed in this table, either in a single location or straddling two nearby slots. For instance, ontological research will or should be combined with, and supporting, most if not all the other fields, or it can take place by itself as basic research. Thus, the critical or aesthetic study of games will benefit from being based on an ontological game model, as will clinical research on the media effects of games, and game design and "serious games" design in their attempts to understand which elements work best and how they relate.

A Brief Overview of Formal Computer Game Ontologies

An early attempt to map the possibility space of so-called "interactive fiction" (another name for text-only adventure games) was made by Richard Ziegfeld (1989). Ziegfeld listed a number of technical and interface elements ("simulation," "interaction" etc.) and suggested how they could be combined. While his terms were typically too imprecisely defined and too overlapping to form a truly useful ontology, he deserves recognition as probably the first computer game ontologist, inspiring later work such as Aarseth (1995). The latter is an attempt to build a comprehensive, generative model that can describe games' formal features along a number of dimensions, such as perspective (vagrant, omnipresent), teleology (finite, infinite), goals (absolute, relative), and so on. Like Ziegfeld's model, it produces a multidimensional space where all games and possible games can be described, but more care is taken to make the dimensions independent and orthogonal. The model can be used for both game design, by identifying new combinations of structures that can result in new games, and game genre analysis, by classifying a number of existing games according to the model, and then analyzing the data set with an explorative method such as correspondence analysis (see Aarseth, 1995).

Empirical Focus:	Artwork	System	Player Activity
Normative/ Prescriptive:	Critical (ideology)	Exploratory (game design)	Utilitarian (serious games)
Descriptive:	Aesthetic (art history)	Ontological	Clinical (player experience)

Figure 59.1 Six research perspectives on games.

Inspired by Christopher Alexander's concept of Design Patterns, Björk and Holopainen (2004) have approached the question of mapping game structures into a large number of game design patterns, design elements that can be found in a number of games. One example is the pattern *paper, scissors, rock*, which can be found in games where the player must choose a weapon or tactic that has strengths and weaknesses relative to the other players' choices. Their method is highly specific and yields a large number of patterns, which may be beneficial for game designers looking for inspiration, but can be challenging to apply in an analysis of a specific game. Jan Klabbers (2003) proposes a top-down ontology where a game consists of three main elements—actors, rules, and resources. Mateas et al. (www.gameontology.com/index.php/Main_Page) is an ongoing project to map structural game elements hierarchically. It has four top-level categories (Interface, Rules, Entity Manipulation, and Goals), and a large number of sub-entries. This ontology is mainly a selection of examples, and the hierarchy is at times less than intuitive (e.g., why is Entity Manipulation a top-level entry, and not placed under Rules?).

The main problem facing game ontologists is that of choosing the level of description for their game models. Games can differ by minute details and most differences would be too particular to generalize into a model. Similarly, the list approach taken by the game design patterns project invites an endless list of patterns; there is no natural stopping point in the model. Another problem is that ontologies that are useful for one purpose may be much less so for another. A general-purpose game ontology may therefore end up as much less useful than one that has been constructed with a special purpose in mind.

What's in a Game: A Simple Model of Game Components

Even within the narrower domain of games in virtual environments, there are tens, maybe hundreds, of thousands of games that are somehow formally different from each other. A game such as *Tetris* (Alexej Pajitnov, 1985) has almost nothing in common with *World of Warcraft* (Blizzard Entertainment, 2004), or with *Super Mario Sunshine* (Nintendo, 2002). Whereas media formats such as print or film have certain well-defined material characteristics that have remained virtually unchanged since they emerged, the rapid evolution in games and game technology makes our assumptions about their media formats a highly unreliable factor to base a theory on. We simply cannot assume that the parameters of interface, medium structure, and use will provide a materially stable base for our observations, the way the codex paperback has remained the material frame for students of literature for more than five hundred years. In ten years' time, the most popular games, played by tens if not hundreds of millions of people, may have interfaces that could be completely different from the MMOGs (massively multiplayer online games) of today. The lack of a stable material frame of reference is not necessarily a problem, however, since it actually allows us to see beyond the material conditions and formulate a descriptive theory with much larger empirical scope, both synchronically and diachronically. Indeed, a trans-material ontology of games may also be used to frame phenomena we normally don't think of as games, for example art installations and other forms of software. In my theory of cybertext (Aarseth, 1997), I presented a general model of what I called "ergodic" communication, which included all works or systems that require active input or a generative real-time process in order to produce a semiotic sequence. I used games as a main example of these "cybernetic texts." As I pointed out, fundamental for these systems is that they consist of two independent levels, the internal code and the semiotic, external expression (1997, p. 40). This distinction was inspired by Stuart Moulthrop's (1991) observation that hypertexts contain a "hypotext," the hidden, mechanical system of connections driving the choices presented to the hypertext reader. This duality is the most fundamental key to the understanding of how representational games work, how they signify, and how they are different from other signifying systems such as literary fiction and film:

> [W]hat goes on at the external level can be fully understood only in light of the internal. […] To complicate matters, two different code objects might produce virtually the same expression object, and two different expression objects might result from the same code object under virtually identical circumstances. The possibilities for unique or unintentional sign behavior are endless.
>
> (Aarseth, 1997, p. 40)

This structural relationship should *not* be confused with the notions of form and content, that is, syntax and semantics, or signifier and signified. Both the internal code and the external skin exist concretely and in parallel, independently and not as aspects of each other. To conflate surface/machine with signifier/signified is a common misunderstanding made by semioticians and other aesthetic theorists who are only used to studying the single material layer of literature and film. Together with gameplay, we propose that semiotics and mechanics are the key elements of which any virtual environment game consists (Figure 59.2).

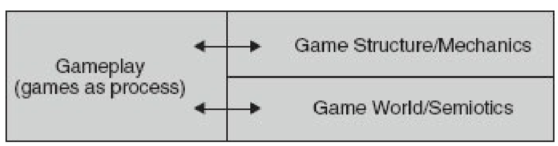

Figure 59.2 A simple division of the empirical object, into three main components.

Mechanics and semiotics together make up the *game object*, which is a type of information object, and when a player engages this object the third component, gameplay, is realized. The game object should not be confused with the material object we buy in a game store. This is a software package that may contain many kinds of information objects besides one or several games. For instance, when using *Max Payne* (Remedy Entertainment, 2001), we are exposed to animated movie sequences and comic book sequences in addition to the gameplay. To use a cliché, game software often contains "more than just a game." The game object is the part of the software that allows us to play. The semiotic layer of the game object is the part of the game that informs the player about the game world and the game state, through visual, auditory, textual, and sometimes haptic feedback. The mechanical layer of the game object (its *game mechanics*) is the engine that drives the game action, allows the players to make their moves, and changes the game state. The tokens or objects that the player is allowed to operate on can also be called game objects (plural); these are all discrete elements that can enter into various permanent or temporary relations and configurations determined by the game mechanics. Game objects are dual constructs of both semiotics and mechanics. Some games may have a player manifested in the game as a game object, typically called an avatar. Other games may simply allow the player to manipulate the game objects directly through user input. A typical example of the latter is *Tetris*, where the game objects are blocks of seven different shapes, and which the player manipulates, one by one, with the simple movement mechanics of move left or right, or turn left or right.

To illustrate the duality of semiotics and mechanics, consider the two simple Internet games *Dean for Iowa* (Bogost and Frasca, 2004) and *Kaboom: The Suicide Bombing Game* (fabulous999, 2002) (Figure 59.3).

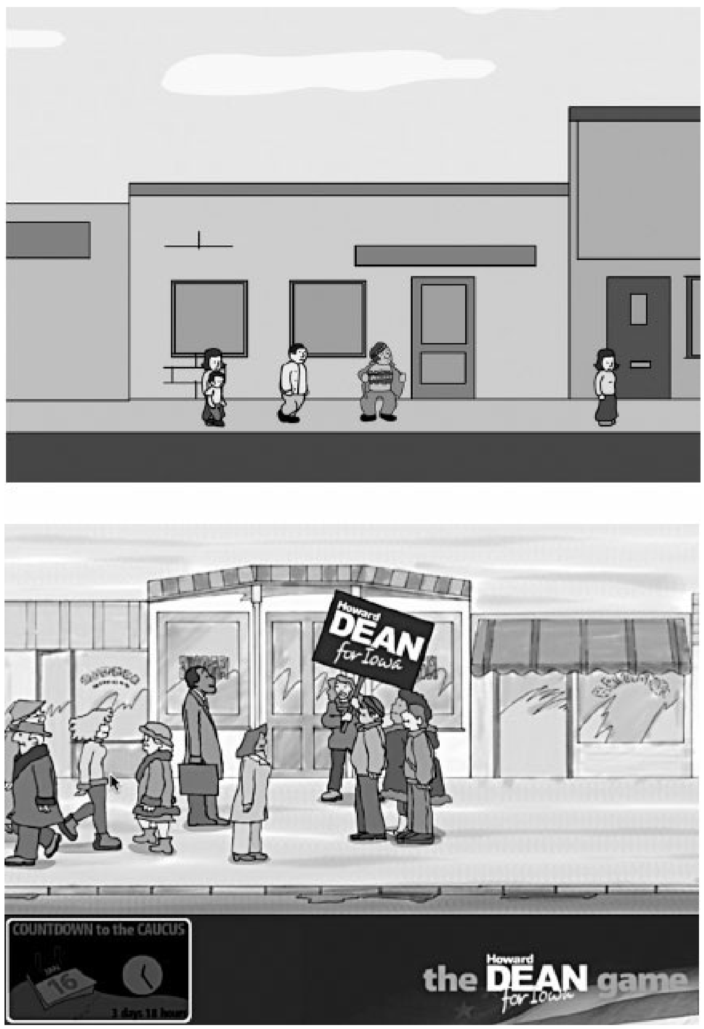

Figure 59.3 Two skins, one system, one game?

In *Dean for Iowa*, the player must flash an election campaign sign at the right moment to attract the maximum number of people's attention. In *Kaboom: The Suicide Bombing Game* the player must detonate the bomb at the right moment to kill and injure the maximum number of people. In both games, the player's character can run bi-directionally on a busy street where people walk back and forth at different speeds, and the points are scored in the same way, by pressing a button at the optimal time. Mechanically, these two games are identical. In terms of semiotics and meaning, they could hardly be more dissimilar. Even so, are they the same game, despite the very different references to the world outside?

As we move from observing the games as played by others and become players ourselves, the different visuals fade into the background and the engagement with the game becomes an obsession with the game goals and mechanics, a narrowly-targeted exercise where the number of points scored becomes the dominant value, not the sight of convinced voters or dead, mangled bodies. While suicide bombing might be too disagreeable for many players, scoring points by symbolically killing virtual enemies is typically not. So the reason why normal, psychologically healthy people as players are able to enjoy symbolic killing is that the internal value system of scoring points takes precedence over the violent symbolism of the external reference, especially in games where the achievement, and not the painful and mortal consequences, is in focus.

The mechanical layer of a game is, of course, not completely devoid of any ideological meaning, but it will, through players playing, create its own ideological discourse, through a reinterpretation of the game's semiotics, which de-emphasizes the ideological meanings and interpretations that non-players will produce upon seeing the game semiotics for the first time.

Neither would it be correct to suggest that the production of game meaning is a deterministic process uni-directionally produced by the game system. Players typically fight and disagree *over* games as well as in them, and this conflict discourse is an integral part of what a game is. Gameplay is inherently ambiguous (Sutton-Smith, 1997) and playing a game is a constant renegotiation of what playing means and how important it is. Games are real to the players playing, but in different ways, and the ambiguous reality of games allows different interpretations. "It is just a game" is the eternal protest heard when player A feels that player B takes the game too seriously. But player A would not have felt the need to remind player B of this seemingly trivial fact, if it had been trivially true at all times. A game is never "just a game," it is always also a ground or occasion to discover, contest, and negotiate and also construct what the game really is, what the game means.

Existential Game Ontology

Finally, there are the existential problems that games and gameplay raise, which we may consider in the dim light of such vague terms and concepts as *fictional* and *real*. Are game phenomena a kind of fiction? Are they more than one kind? Can they be real? If so, in what sense? Or should we simply introduce a third category, the *virtual*, to save ourselves from facing this thorny issue?

For Caillois, games are based on either rules or fiction. *Agôn* and *alea* games are ruled, and *mimicry* games are fictional. We may readily concede that "mimicry," in the cases of theater and role-play, is typically fictional in its reference, but does it have to be? A play on stage can be fictional, but it can also be documentary. Mimicry (mimesis, representation) is neutral on the documentary–fictional continuum, and if we employ a classic definition of fiction such as Dorrit Cohn's, where fiction is "literary nonreferential narrative" (Cohn, 2000, p. 12), we can easily distinguish between fictional and documentary narratives. We can even extend her definition to any nonreferential discourse, and include paintings, sculptures, and other figurative, image-type nonreferential signs. All it takes for these to be fictional is that there exists no referent in our non-fictional world. However, if such a referent exists, the discursive object or sign must be classified as non-fictional, or documentary. So Caillois is incorrect in linking mimicry only with fiction and the fictional; a theatrical play may be documentary as easily as it is fictional. For representational games, this means that as long as the game objects refer to events and existents in our world (e.g., in our history), they do not fictionalize but document. Fullerton (2008) proposes an excellent discussion of documentary games. She distinguishes between generic and specific simulations; a generic simulation is referring to a type of object, while a specific simulation is referring to a particular, historical token object. In Fullerton's view, documentary simulations and games do not have to refer to specific objects to be documentary; they can also refer to generic objects (e.g. a type of airplane) and the resulting simulation is still documentary, not fictional.

But what about objects in non-documentary games, or objects that simply do not have a historical referent, such as an orc or a magic pearl? With regard to objects such as these, two oppositional schools can be said to exist: ludo-fictionalism and ludo-realism. The ludo-fictionalist school, inspired by Kendall Walton's radical and influential *Mimesis as Make-Believe* (1990), one the one hand, sees games, game objects, and game-worlds as fictional, as "props in a game of make-believe." For them, the rules may be real, but the discursive elements and actions are fictional (Juul, 2005; Bateman, 2011). The ludo-realist school, on the other hand, sees game objects and game events as real, or at least closer to reality: "Simulations are somewhere in between reality and fictionality: they are not obliged to represent reality, but they do have an empirical logic of their own" (Aarseth, 1994, p. 79, see also Aarseth, 1997, 2007). Evidence for the ludo-realist position was produced by Edward Castronova's (2001) seminal observation that the in-game currency of the massively multi-player game *EverQuest* (1999) had a real-world exchange rate, and therefore was indistinguishable from any other (real-world) currency. This renders *EverQuest*-money very different from fictional money, or even from ludic money found in board games such as Monopoly (Charles Darrow, 1935).

Moreover, players typically treat important in-game objects much the same way they treat their extra-ludic property, including sometimes going to extremes such as murder when they are robbed in-game (BBC, 2005). It is not uncommon for game objects traded online to reach price-levels similar to quite expensive commodities, such as (physical) jewelry or cars. Not only does this make the ludic objects different from fictional objects, but it places them on an entirely different ontological level, in the same category as digital word processing documents (which we treasure despite their non-tangential mode of existence) and money in our digital bank accounts. The signs generated by the games' interfaces, unlike those of fictional media productions, are in fact referential, and therefore non-fictional: they refer to the information objects (e.g., cellular automata) maintained by the game engine.

The personal nature of our relationships with ludic objects, like our relationship with say, sports equipment, indicates strongly that we are not dealing with fictional props in the Waltonian sense. A prop is a physical object that refers to a fictional object, and whose existence and capabilities are secondary to those of the fictional object. But there is no need for make-believing when players shoot at each other in *Counter-Strike* (Valve Corporation, 1999); they are manipulating nonphysical, informational guns that shoot non-physical, informational projectiles and when their avatars are hit, they do not have to make-believe that they are eliminated. This happens, factually, in the game machine, entirely independent of the players' imagination, just like a pinball when it drops below the reach of the flippers. The game software determines the characteristics of the objects players use, and they cannot change these by make-believing them to be something else, any more than theatre audiences can change a stage prop by imagining. Unlike the stage prop, however, the use-relationship between player and object is primary.

Existential game ontology challenges the already unclear notions of fictional and real, and especially the border between them. But this seems primarily a problem for the theorists of fiction and those who use the concept without a critical consideration of its limits, especially when other concepts could be used instead. Game theorists, and more importantly, players, do not seem to need a definition of fiction to grasp the ontology of games and gameplay.

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60

TRANSCENDENCE

Mark Hayse

Introduction

Video games possess considerable power to evoke an experience of the transcendent—from the Latin *transcendere*, literally "to climb beyond." Simply put, the quest for transcendence is a quest for something *more*. The study of transcendence deserves a rightful place alongside the study of other psychological, educational, and literary theories at work in video games. Indeed, these theories constitute a rich, conjunctive framework for exploring transcendence within gameplay experience—particularly when brought into dialogue with religious studies. As a research concern, transcendence encompasses certain aspects of religion even as it surpasses religion. In video game studies to date, religion seems underutilized as a framework for inquiry. Of course, the erosion of religion's relevance stands to reason, following the modernist project of rationalism and empiricism. More recently, however, process philosophy and constructive postmodernism seek to reengage religion as a conversation partner with other disciplines (Griffin, 1988; Slattery, 2013).

Transcendence at the Intersection of Religion and Technology

The precedent literature in technology studies underscores the importance of transcendence as a research concern. Various technology theorists explore the human–technology relationship within the rhetoric of a divine–human relationship (Wiener, [1964] 1966; Drexler, 1986; Mazlish, 1993; Kelly, 1995; Cobb, 1998; Kelly, 1999; Kurzweil, 1999). Heim (1993) presents one of the most carefully developed arguments in this discussion. To Heim, virtual reality stands alongside religion as an expression of transformative art (pp. 124–126). "In the face of the infinity of possible, virtual worlds" he writes, virtual reality sets the stage for "an experience of the sublime or awesome" (p. 137). Heim attributes the allure of virtual reality to *eros*: the "drive to extend our finite being" and "to heighten the intensity of our lives" (p. 87). At the same time, he argues that the finite computational structure of virtual reality paradoxically weakens its ability to mediate transcendence. Heim explains:

> Knowing that the computer God's-eye view remains closed to the human agents in cyberspace, they will know that such a view exists. Computerized reality synthesizes everything through calculation, and nothing exists in the synthetic world that is not literally numbered and counted.

> […]
>
> Can we be touched or surprised—deeply astonished—by a synthetic reality, or will it always remain a magic trick, an illusory prestidigitation?
>
> […]
>
> The ideal of the simultaneous all-at-once-ness of computerized information access undermines any world that is worth knowing. The fleshly world is worth knowing for its distances and hidden horizons.
>
> (pp. 105–107)

Visitors to virtual reality take that trip in part because they seek something transcendent, something *more*. Heim locates the highest expression of transcendence within the human Other, contending that the non-human Other of hardware and software necessarily limits one's quest for transcendence.

Undismayed, video game players and theorists suggest that video games can mediate various aspects of transcendence. For example, Castronova (2005) argues that the massively multiplayer "synthetic world" invites players toward "vistas" of "longing" (pp. 106–108), wrapped in myth and wonder (p. 276). Castronova writes elsewhere: "Wonder, in the sense of miracle, mysticism, and faith, may well be the single most important contribution of virtual worlds to human experience" (2007, p. 201). Bissell (2010) colorfully compares the "ample" and "complicated" allure of video game worlds to religion, their potency "hard to explain, sort of like religion, of which these games become, for many, an aspartame form" (p. 4). Callaway (2010) suggests that the holistic experience of *Wii* play can usher players into a spiritual experience through its integration of the sensual, somatic, and affective. Wolf's research into Tolkienian subcreation argues that the designers of "secondary" video game worlds imaginatively imitate the "primary" world-making creativity of God (2012, pp. 20–25; 283–287).

Reflection upon the intersection of transcendence and particular video games dates from the advent of *Pac-Man* (Midway Manufacturing, 1981) to the present day (McFarland, 1982). For example, Meneghelli (2007) and Cogburn and Silcox (2009) observe that the "god game" genre often affords players with a sense of virtual omniscience, omnipresence, and omnipotence, which Friedman (1995) describes as "an almost trancelike state" (p. 85) of "complete communion" (p. 83) with the game system. In a related vein, *SimCity* (Maxis Software, 1989) creator Will Wright recalls an early personal experience with an island-mapping utility that fascinated him with the initial possibility of "bringing a city to life" (Kelly, 1995, p. 235). He further explains his fascination with virtual creation in terms of openness to emergence and appreciation for interconnection (Pearce, 2002). McGonigal (2011) maintains that "epic" video game actions, environments, and projects connect us with "something bigger than ourselves" (p. 97), inducing a sense of reverence—"the expression of profound awe, respect and love, or veneration" (p. 103). McGonigal submits the online *Halo* Museum of Humanity as evidence (pp. 103–104), arguing that the monumental achievements of the entire *Halo* community elicit a sense of reverence from its own players (pp. 95–96).

Transcendence at the Intersection of Religion and Psychology

Nineteenth- and early twentieth-century literature in psychology reflects a sustained interest in the multivalent nature of transcendence. For example, James investigates transcendence both in the effects of nitrous oxide (1874, 1882) and in the varieties of religious experience ([1902] 2004). He describes the transcendent in terms of “incommunicability” (1874), “intence [*sic*] metaphysical illumination” and “unbroken continuity” (1882), ineffability ([1902] 2004, p. 50) and enchantment (p. 52). Throughout his work, he acknowledges that religious experience takes a great many forms. Later, Otto ([1950] 1958) describes religious experience as a *sui generis* (unique and particular) encounter with God that surpasses rational and ethical terms (pp. 6–7). To Otto, this encounter involves both *tremendum* and *mysterium*—a sense of awe before that which is hidden from human understanding (pp. 13–24). Otto writes that God, as *mysterium tremendum* “exercises a supreme ‘fascination’ … at once an object of boundless awe and boundless wonder, quelling and yet entrancing the soul” (p. 41). In Taves’s recent critique of James and Otto, she argues that “emotional valence” is “not always the most salient feature” of religious experience (2009, p. 11). She argues that the interplay of imagination with reality can also characterize religious experience, especially at the points of ritual play and meditative practice. In summary, religious experience is not coterminous with transcendence, although a strong correlation exists between the two.

Later literature in psychology continues to explore the intersection of transcendence and religious experience. Batson and Ventis (1982) liken religious experience to a lifelong “quest” for existential insight in the midst of unknowing. They write: “There may not be a clear belief in a transcendent reality, but there is a transcendent, religious dimension to the individual’s life. We shall call this open-ended, questioning orientation *religion as a quest*” (p. 166). Csikszentmihalyi (1991) compares the transcendent aspects of religious experience to “flow”—an immersive experience of pleasure, joy, and fulfillment in which self-consciousness and time-awareness dissipate (p. 49). Csikszentmihalyi also notes the relationship between flow and gameplay, acknowledging the historic and once close link between play and religion (pp. 76–77). Other scholars note this link as well (Huizinga, [1950] 1955; Pannenberg, 1985, pp. 321–322).

Scholtz (2005) explores transcendence through the lenses of religion and psychology in his preliminary, phenomenological exploration of *The Legend of Zelda: The Ocarina of Time* (Nintendo EAD, 1998). Although he is a new video game player, he recognizes their capacity to mediate a flow experience. He acknowledges the presence of religious elements within gameplay. For examples, Scholtz underscores the importance of the game’s mythological images and the quest motif. He associates the player’s fascination with the player’s desire to unveil a mystery. He struggles to describe the ineffable qualities of gameplay. Of course, video games other than *Zelda* can mediate this kind of religiously infused encounter. For example, home console and arcade cabinet games from *Breakout* (Atari, 1978) to *Pac-Man* to *Donkey Kong* (Nintendo, 1981) facilitate flow experiences within the context of meaningful reflection (McFarland, 1982; Sudnow, 1983; Cunningham and Gordon, 2007; Verrechia and Ruchti, 2007). Role-playing games from *Ultima IV: Quest of the Avatar* (Origin Systems, 1985) to Mass *Effect* (BioWare, 2007) wrap quests within the trappings of myth and mystery. In Scholtz’s case, he stops short of describing *Zelda* gameplay as a strictly religious experience. Nevertheless, his work demonstrates that the psychology of religion can prove helpful as a framework for video game analysis.

Transcendence at the Intersection of Religion and Education

The interdisciplinary tradition of religious education outlines the conjunction of religious experience, the learning process, and the process of human development. Astley (1994) maintains that religious education is less a cognitive matter than an affective matter (p. 77), "primarily concerned with emotions like awe, reverence, guilt, fear and love, directed toward certain objects" (p. 219). Whitehead ([1929] 1967) argues that education is inherently religious because it encompasses the search for wonder, reverence, and "the tumultuous desire for merging personality in something beyond itself" (p. 40). Likewise, Dewey ([1934] 1972) contends that human experience is religious—not in an orthodox sense (pp. 43, 51), but to the extent that it seeks wholeness (pp. 18–19), engages the imagination (p. 49), and aspires to ultimacy (pp. 19, 57, 83). The educational "lure of the transcendent" recurs throughout Huebner's work ([1985b] 1999, p. 360), as do references to both Dewey and Whitehead. Huebner argues that school should be a place for mystery, wonder, and awe ([1959] 1999, p. 8). Elsewhere, he claims: "Education is only possible because the human being is a being that can transcend itself" ([1985a] 1999, p. 345) through openness to possibility (p. 343), creative expression (p. 344), and response to the Other ([1993] 1999, p. 409). Huebner explains: "The religious journey, the process of being educated, is always a consequence of encountering something that is strange and different, something that is not me" (pp. 407–408).

Contemporary curriculum theorists thematically build upon the scholarship of Whitehead, Dewey, and Huebner. Phenix defines the transcendence-oriented curriculum as an experience "of limitless going beyond any given state or realization of being … within a context of wider relationships and possibilities … always open to a neverending web of entailments and unfoldings" ([1971] 1975, p. 324). Like his predecessors, Phenix maintains that the yearning and capacity for transcendence is "essential, not accidental, in the being of persons" (p. 337). He identifies the general dispositions of the transcendence-oriented curriculum as hope, creativity, awareness, doubt and faith, wonder, awe, and reverence (pp. 328–332). Purpel (1999) compares the transcendence-oriented curriculum to the journey of the ancient patriarch Abraham—as "possibility grounded in quest, a process of passionate searching that begins in an emerging awareness of greater possibility and … meaning" (p. 217). Likewise, Slattery ([1992] 1999) suggests that the transcendence-oriented curriculum must be *eschatological* (future-oriented). Hidden horizons occasion hope, and hope invites learners to seek that not yet revealed. Elsewhere, Slattery (2006) refers to eschatological curriculum as "proleptic"—a literary term that indicates "the moment in a short story or novel when the reader becomes fully cognizant of the past, present, and future events all in one instant" (p. 84; see also 2013, pp. 282–283, 305–306). This brings to mind the epiphanic or "aha moment" in film when insight sweeps over the protagonist and viewer, past and present events suddenly converging with new interpretive meaning. For example, consider Bruce Willis's proleptic moment at the climax of *The Sixth Sense* (Shyamalan, 1999). In a cinematic flash, both the protagonist and the viewer suddenly come to understand that Willis's character has been dead throughout most of the film, reframing the entire story within a greater revelatory frame of meaning.

Jason Rohrer's *Passage* (2007) vividly illustrates the transcendent, religious, and educational potential of video games. Exceedingly simple in its technical design, *Passage* possesses the power to elicit deep discernment from its players. As each five-minute game unfolds, the player searches a maze-like playing field for various rewards such as companionship and intimacy, wealth, and fame. Points accrue with each step, doubling when accompanied by a life partner, even though a life partner's presence restricts certain aspects of gameplay. Along the way, the player's character ages—steadily, stubbornly, and almost imperceptibly—until death overtakes him and his life partner. Death in *Passage* is inevitable, unlike the endless recursion of life and death in other video games. No instructions accompany the game, its meaning subtle and elusive. Thompson (2008) praises *Passage* as "a fantastically expressive, artistic vehicle for exploring the human condition." Montfort (2009) observes that the insights of *Passage* gradually dawn upon the player throughout gameplay, mediating a meditative experience upon the meaning of life. In the most literal sense, *Passage* constructs an eschatological horizon that is often hazy and blurred, just like memory and hope. It deliberately escorts the player toward a proleptic event in which the meaning of the game—past, present, and future—converges with the player's own reflection upon life's brevity and death's ultimacy. The gameplay of *Passage* envelops its players in mystery, confronts them with wonder, and invites them into reverence. *Passage* vividly demonstrates how even a video game "curriculum of transcendence" can usher players into an affective journey of unfolding possibility and profundity.

Transcendence at the Intersection of Religion and Literature

The mythopoeic works of Tolkien and Lewis winsomely and persistently point to the transcendent. Mythopoeia hinges upon the conviction that the modernist world of empiricism and rationalism—starving for imagination and rejecting the spiritual—needs new myths that can "bridge the chasm of a strict, philosophical materialism." Both Tolkien and Lewis weave their literary fabrics to that end. Quite literally, Tolkien and Lewis understand their myth-making work as a service that points to God. For example, Tolkien understands myth as "a splintered fragment of the true light" (Carpenter, 1979, p. 45), while Lewis explains myth as "the isthmus which connects the peninsular world of thought with that vast continent we really belong to" ([1944] 1970, p. 67). More particularly, Tolkien and Lewis understand tales of Faërie and fantasy as signposts that simultaneously mediate and point to transcendence. Of Faërie, Tolkien ([1964] 1966) writes:

> The definition of a fairy-story—what it is, or what it should be—does not, then, depend on any definition or historical account of elf or fairy, but upon the nature of Faërie: the Perilous Realm itself, and the air that blows in that country. I will not attempt to define that, nor to describe it directly. It cannot be done. Faërie cannot be caught in a net of words; for it is one of its qualities to be indescribable, though not imperceptible. It has many ingredients, but analysis will not necessarily discover the secret of the whole.
>
> (pp. 38–39)

Similarly, Lewis ([1956] 1982) writes:

> [F]airy land arouses a longing for he knows not what. It stirs and troubles him (to his life-long enrichment) with the dim sense of something beyond his reach and, far from dulling or emptying the actual world, gives it a new dimension of depth.

(p. 38)

Both writers affirm a shared conviction that the function of *eucatasrophe*—"the joy of the happy ending" (Tolkien, ([1964] 1966), pp. 85–86)—signifies a greater reality: a "sudden glimpse" or "far-off gleam or echo" of transcendence in this present world (p. 88). To Tolkien and Lewis, the mythic realms of Middle-Earth and Narnia invite their readers to enter them wholly, even though that longing must remain somewhat unfulfilled. Thus, Lewis remarks, "Our best havings are wantings" (as cited in Martindale and Root, 1989, p. 359).

Citing Burke, Krzywinska (2009) thoughtfully notes that the notion of the sublime corresponds to the notion of terror (p. 278). Lovecraft's work in dark fantasy and supernatural horror illustrates this point. His protagonists inevitably suspect the presence of a cosmic threat to humankind, temporarily hidden from view. As they gradually uncover that threat, madness and death pursue them until the bitter end. Mendlesohn (2008) describes Lovecraftian fiction in terms of "intrusion fantasy," a kind of fantasy in which the *anticipation* of intrusive transcendence makes a greater mark upon the reader than its ultimate *appearance* at the end of each tale (p. 135). Mendlesohn suggests that intrusion fantasy accomplishes its goal, in part, "by moving the descriptive element from *sense of wonder* to *sense of fear*" (p. 136). In this vein, Lovecraft memorably pens: "The most merciful thing in the world, I think, is the inability of the human mind to correlate all its contents" ([1926] 2005, p. 167). Mendelsohn also argues that the transcendent dimension of intrusion fantasy moves in two directions at once: "that of the intrusion breaking through" and that of "the protagonist moving into this secret world" (p. 137). Lovecraftian tales hinge upon the transgressive link of horror and transcendence.

Video games variously reflect not only the beauty of transcendence but also the terrifying intrusion of transcendence. Hayse (2011) argues that *The Legend of Zelda: The Wind Waker* (Nintendo EAD, 2002) mediates the longing for transcendent beauty in its art, music, narrative, and procedural structure. The game's brightly tinted palette and cel-shaded animation evokes a Pixar-like quality of wonder, once restricted to the silver screen. The music teases its hearers with a rolling sense of anticipation that rarely resolves into the tonic. The narrative mediates the monomythic Hero's Journey of separation, initiation, and return (Campbell, 1962). A serialized structure regulates this hope-filled quest at a pace that the player cannot accelerate, insistently pointing toward the revelatory horizon of *eucatastrophe* but delaying its dawning. Likewise, the procedural structure incrementally reveals layer upon layer of unfolding mystery, tantalizing the player with actions and artifacts that prove sufficient for the present moment while hinting at greater vistas that remain unexplored for the time being. In contrast, games such as *Alone in the Dark* (Infogrames, 1992), *Eternal Darkness: Sanity's Requiem* (Silicon Knights, 2002), and *Call of Cthulhu: Dark Corners of the Earth* (Bethesda, 2005) taunt the player with the horrifying threat of transcendent intrusion. The formal elements of games such as these mediate the "staging of fear" (Roux-Girard, 2009, p. 146). Acoustic sounds induce fear by creating anticipation (p. 152), just as the use of silence builds up suspense (p. 153). *Alone in the Dark*'s refusal (and technical inability) to center the player in game space effectively mediates a sense of dread (pp. 151–152). Dramatic and unsettling shifts in point-of-view rupture the player's confidence to control the events of *Dark Corners of the Earth* (Krzywinska, 2009, pp. 273–274). In both *Eternal Darkness* and *Dark Corners of the Earth*, the protagonist's sanity steadily erodes, encroaching not only upon the player's point-of-view but also upon the player's ability to control the game (pp. 282–283; Weise, 2009, p. 262). These formal elements suggest the dreadful threat of transcendence, threatening to overwhelm the player.

Conclusion

The study of transcendence in video games rests at the crossroads of technology, psychology, education, literature—and religion. While these former disciplines already inform much video game scholarship, the latter remains underutilized. The academic inquiry into religion promises new insight for video game studies, both unique and profound. To that end, this discussion proposes a research agenda for the consideration of transcendence in video games, each element proceeding from the occasion of "climbing beyond":

- the playful, even mystical transition from the ordinary into the extraordinary or virtual;
- the often hard-to-describe pleasures or fears that accompany fascination;
- the transformative encounter with Otherness;
- the longing—and the quest—to grasp that which is mysterious, wondrous, elusive, or hidden;
- the epiphanic shift in perception or perspective;
- the imaginative encounter with myth, archetype, or symbol—whether sublime or profane.

Beyond the limits of this discussion, additional disciplines also shed further light upon the study of transcendence, such as:

- anthropological inquiry into the liminal and liminoid (Turner, [1982] 2001);
- neuroscientific research concerning the nature of religious experience (Beauregard and O'Leary, 2007; Hagerty, 2009; McNamara, 2009);
- educational investigation into transformative learning (Mezirow and Associates, 2000);
- theological reflection upon aesthetics (Viladesau, 1999, Thiessen, 2004);
- comparative study of the world's wisdom traditions (Smith, 1991, 2001).

In the final analysis, the study of transcendence promises insight both unique and profound for video game studies, potentially opening the door to greater enjoyment in gameplay and greater depth in game design.

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INDEX