Extending Experiences

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Structure, analysis and design of computer game player experience

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Prologue

The impetus for the publication of this book came from far north in Finnish Lapland, but the collaboration leading up to the finished copy you are holding was a learning process between three PhD students in four countries and on two continents. Obviously, we are indebted to many. We want to thank our home universities and thesis supervisors for offering us the time and intellectual space to work with the book. In the beginning they were just two, but now there are four to thank: IT University of Copenhagen, Universidade Metodista de São Paulo, University of Lapland and University of the West of England. Thanks to Espen Aarseth, Anker Helms Jorgensen, Sebastão Squirra, Eija Timonen and Estella Tincknell.

As the IT University of Copenhagen was the place where we three, visiting researchers at the time, met and started working on this book together, people at the ITU Center for Computer Games Research are to thank. Especially Jonas Heide Smith encouraged us by sharing his own editorial expertise.

We are grateful to our reviewers and writers, who showed significant patience and experience throughout the process. Thanks go to Publishing Coordinator Tuula Tervashonka from the University of Lapland Press for helping us in many ways with her solid expertise.

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Our aim for this book was to bring together work on the relationship between games and their players. We also wanted to draw attention from games to players, which again broadens our knowledge on games themselves. Discussing player and games, the chapters of this book present a variety of factors that influence player experience, or play experience, as lived, theorised, analysed and designed.

The chapters of this book are structured into four parts, each preceded by an introduction discussing some of the common themes shared by its

chapters. The foreword by Sam Inkinen provides insights on the current and upcoming developments of experiences with interactive media. The first part of the book, Experiential *Structures of Play*, discusses some of the key concepts often used to address players' experiences. Chapters in Part 2, *Bordering Play*, address the forms of computer game play which somehow, either practically or conceptually break out from the "magic circle". Part 3, *Interfaces of Play* takes the technology involved in computer game play as the starting point for observations. The fourth and final part, *Beyond Design*, consists of insights on game design, abstracted and structured into the form of two design models.

Copenhagen, Bristol and Sao Paolo,
March 2008
the editors

Sam Inkinen

Quo vadis, homo ludens?

> The media themselves are the avant-garde of our society. Avant-garde no longer exists in painting and music, it's the media themselves.
> – Marshall McLuhan (1973)[1]

MATRIX A: NEW DEVELOPMENTS IN THE WORLD OF MEDIA

Today we are living in a new reality: the reality of *digital media*. At the same time, we are witnessing the emergence of a *game world*. How does one relate to the other? Is the game world a reflexion of media reality, or is it the other way around? As technological extensions of our senses, in what manner do media reality and the game world extend our experiences?[2] In what follows I shall outline some aspects regarding these questions.[3]

Level 1: Key Words for the Play

Game perception does not follow the logic of cinema or TV. The player is not a viewer but an agent of action, a creator of one's own world.

This paradigmatic difference also touches on the research perspectives of game world. Some relevant keywords should be mentioned here: convergence and hybridization, interactive subject position, projective game situation, media as an artificial sensorium, community and conviviality, game theory... and even more: simulation, virtual reality, immersion, avatars, paraspace (Bukatman), post-modern subject, multidimensionality, non-linearity, broadband Internet, massively multiplayer online games (MMOGs)...

Level 2: Zeitgeist: Extending Experiences

In the contemporary world, our way of living is increasingly mediated and even expanded by media experiences. We are living in the age of *experience design*: mediated, first-hand experiences are giving way to synthetic experiences generated by new media. "Experience," "experience economy,"[4] "experi-

1 See McLuhan & Zingrone 1997, 274.

2 Cf. Bolter & Grusin 1999.

3 I would like to thank Hannu Eerikäinen for his fruitful co-operation in recent years and his comments on the ideas presented in this article.

4 Pine & Gilmore 1999.

ence society" (German, *Die Erlebnisgesellschaft*)[5] and "experience pyramid"[6] have become central themes and notions to describe contemporary society, economy and culture.

The deeper semantic meaning of these catchphrases, however, is not simple; they are very complicated and open to different associations. Historical background is also relevant. Few contemporaries remember, for example, that futurist-visionary Alvin Toffler had already referred to the significance of industrially manufactured experiences in his classic book *Future Shock* (1970).

Various kinds of experiences, spectacles and effects clearly belong to the millennial *Zeitgeist* (spirit of the age) of the early 2000s.[7] Video and computer games as a remarkable growth field of digital media culture and "digital ecosystems" are one example of developments in today's "dream society"[8] and "experience economy":

> Digital media and games are knocking on experience economy's door, and they are becoming more and more connected to experience production and to the field of experience industry. Gaming and storytelling via different channels have throughout the ages been an important part of our everyday life as well as a form of entertainment. During the recent years, game design and digital media productions have also become an increasingly significant business sector with remarkable growth rates. However, discussion on experience economy has neglected to a great extent this new form of experience production that is present in most business sectors as well as [in] a branch of its own.[9]

Level 3: The History of Media

The history of media is also the history of different tools, scientific models and schemes. Media scholars and cultural researchers like to emphasize the importance of *mediatization* as a basis for contemporary, "post-modern" society. It should be noticed that in addition to being tools for communication and expression, media are also *identity devices* that affect the persona, world view and subjectivity of an individual. This is the situation for both traditional mass media (the broadcast paradigm) and digital, interactive new media (the game paradigm).[10]

5 Schulze 1992.

6 "Experience Pyramid is a tool for promoting experientialism in products and services. It approaches experience production from two point-of-views: customer experience and elements of the product. The Pyramid approach suggests that the product should include six elements for being experiential: individuality, authenticity, story, multisensory perception, contrast and interaction. Through these elements customer's experience proceeds from motivational level to physical, intellectual and emotional, even spiritual levels." By using the Pyramid model it is possible to analyze and understand the experiential aspect of tourism, design, digital media, entertainment, cultural products, etc. The Pyramid model "represents an ideal product in which every element is included on all levels". Together these elements can create the prerequisities for experiential situations and therefore create a possibility for the customer to have an experience. (http://www.elamystuotanto.org/?deptid=21989)

7 On Zeitgeist issues see Inkinen 1999.

8 Jensen 1999.

9 Kylänen 2006: 3.

10 Inkinen 2005.

Many expressions beginning with *homo* (Latin, meaning the human being) have been created over the centuries. The central terms of contemporary discussions have been *homo ludens*, the ludic human, *homo cyber*, the human of the technological future, *homo intelligens*, the human with widening knowledge and awareness of ethical and educational challenges (knowledge society), and the classical *homo faber*, the instrument and engineering oriented "smith." In addition, a post-modern contemporary perceives and experiences the information rich world in an *aesthetic* manner. To describe this type of person, I shall borrow the notion introduced by the Finnish scholar Aki Järvinen: *homo aestheticus-informaticus*.[11]

Level 4: The Ecstasy of Communication

In his classic, *Transparent Society* (1989), Italian philosopher Gianni Vattimo has aptly stated that in the contemporary media culture "everything" becomes a subject of communication. Jean Baudrillard, on the other hand, has sharply commented on and analyzed the post-modern condition as the "ecstasy of communication".[12] The commercial logic of show business, different kinds of spectacles and "extended experiences" will irrevocably lead to the expansion of the sphere of media publicity to touch areas that have been previously considered private (Reality TV, Internet Web-cam applications, picture messages sent via mobile phones, next generation of video games, etc.).

As media based on images, audio and text – i.e. dynamic, interactive multimedia – is assuming an increasingly central role in (digital) culture, the interpretation, decoding and understanding of multimedial and multimodal messages becomes more important. *The aesthetic element*, that is part of the original definition of education, gains new meaning and its role is emphasized. It can also be seen that the effects of computer networks, video games, hypermedia, virtual realities, robotics, etc. will reach all areas of life and touch almost everyone – even those who are not directly interested in, or connected to them.

Level 5: The Game Paradigm

The game paradigm is a significant part of the broader field of digital media. It must be emphasized that technology *per se* does not alter the world or social reality, but by being connected to different cultural forms and social processes it affects the forces that construct identities and mould personalities.

Thus, in the post-modern *media society*, one can say without exaggeration that digital information, telecommunication technology and new media intrude ever deeper into people's everyday lives. For example, the Internet and mobile phone cultures (including games) of recent years have had concrete and irreversible effects on the media practices and everyday routines of contemporaries. As technical integration has travelled towards a "smart phone"

11 See Järvinen 1999a: 170.

12 Lyotard 1984; Baudrillard 1988; cf. Baudrillard 1983.

and "communicator" that utilizes networking, dynamic multimedia (including more and more games), artificial intelligence and more advanced hyper textual methods, the meaning of the mobile phone as an "identity device" has become increasingly important.

Level 6: Convergence and Hybridization

Rapid convergence of digital media brings telephone networks, television and the Internet closer to each other. Broadly speaking, *multi-channelling*, *multiple media*, *cross-media*, *polymedia* and *hybrid media* are synonyms and closely related to the new dynamic interrelationships of new digital technologies (so called online paradigm) and their integration with traditional offline technologies. These terms refer to the merging of two or more media environments and/or transmission channels, for example, the Internet, mobile communications, digital television and print. In other words, the media world today is dominated by convergence and hybridization.

The most important factors affecting the formation of the "computer subject" and "Internet subject"[13] that operate in the networks and threads of digital media are navigation, intertextuality, hypertextuality and multimediality. These factors can be said to affect the media culture in a *qualitative* manner. The significance of *interaction* (as a paradigm shift from the traditional broadcast paradigm to the interactive media paradigm) has been underlined in the new media contexts and discussions – not least with gaming. Interactivity points to creating information, meanings, experiences, identity or even new cultural expressions together. Sometimes interaction has turned into a key term and a too promising mantra of a techno-utopia.[14]

MATRIX B: EXTENDING EXPERIENCES

What exactly is *experience*? We should, in fact ask, what makes an opera play, a music video or a computer game an experience? The semantic meaning of the word "experience" differs in various languages. The English "experience" means both Finnish *elämys* and *kokemus*. The German language makes the same distinction: *Erlebnis* and *Erfahrung*.

Some scholars have pointed out that there are different levels of experience in the so-called "experience pyramid," the model that describes the structure and nature of experience. At the bottom is the *motivational level*. Next is the *physical level*. Third is the *rational/intellectual level*. Fourth is the *emotional level* (or actually experiencing the meaningful experience). The last and top level is the *mental level*.[15]

13 Cf. Järvinen 1999b.

14 For a critical perspective see, for example, Inkinen 1999b.

15 Tarssanen & Kylänen 2006: 138-139.

MATRIX C: PRODUCT

Increasingly our world of experience is moulded by new media products (such as video games). The so-called "Experience pyramid" approach also suggests that a product (e.g. a game product) should include six elements to be experiential: (1) individuality, (2) authenticity, (3) story, (4) multi-sensory perception, (5) contrast and (6) interaction.[16] To cite Finnish scholars (levels 1-6):[17]

Level 1: Individuality

The first critical element of a product is *individuality*. This means the product's own superiority and uniqueness: there is no other product which is exactly or roughly the same. Individuality is also seen as customer-oriented way-of-action in staging the product.

Level 2: Authenticity

Authenticity in the context of experience products relates to the credibility of the product. At the simplest it refers to a real-life way-of-living and culture of the region or items made by the locals.

Level 3: Story

The story of a product is closely linked with the authenticity. A genuine story links the experience with reality and gives the content and a social meaning for it.

Level 4: Multi-sensory perception

Multi-sensory perception means that the product should be capable of being experienced with as many of the senses as possible. It should be visually influential, appealing to the senses by odour and aroma, as well as audible and capable of being tasted and felt as tactile sensation.

Level 5: Contrast

Contrast refers to difference from the perspective of the client. The product must be different from the customer's everyday routines.

Level 6: Interaction

Interaction represents the relation between the customer, the guide and the other travel participants. It represents successful communication with the product and its producers.

16 http://www.elamystuotanto.org/?deptid=21989
17 Tarssanen & Kylänen 2006: 140-146.

MULTIMEDIALITY AND MULTIMODALITY

I would like to discuss the role of *multi-sensory perception* here more in detail. New and fresh key concepts to guide research have been defined in both R&D laboratories and the field of academic research. An example of this is *multimodality*. It is an interdisciplinary academic topic of study, which has become more popular and is settling via several different routes – through research into multimedia and computer networks, electronic art, and intermediality. Multimodality points to the fact that culture and communication always contain many elements and media forms. For example, the spoken language is not only verbal but also visual, since it includes non-verbal signs: facial expressions, gestures, etc.

Communication and media culture have traditionally been approached from this direction by semiotics[18] and research of audiovisual media culture. It is not surprising that multimediality and multimodality have also a central role in new media research. This research perspective opens up new views of audiovisual media texts and in understanding culture on a more general level. It is especially useful in understanding the continually changing phenomena of digital culture.

SYNESTHESIA

In this context, it is justifiable to mention *synesthesia* as a concept related to multimodality and *cross-media* thinking. Synesthesia refers to stimuli to one sense resulting in two sensory reactions. For example, while listening to music a person may also "see" or sense the sound as colours or images. Music often transports feelings, moods and mental images. Because of this, music is strongly synesthetic: music may have the attributes of hard, soft or clanking and provoke similar visual associations.

Synesthesia has a central place in western art and culture. Our cultural and art history is filled with examples relevant to synesthesia. For example, the famous *The Flowers of Evil* anthology by poet Charles Baudelaire (1821–1867) includes a poem related to synesthesia called "Correspondences." A highly interesting exhibition, *Sons & lumières* (Sound & Light) was organized in Centre Pompidou, Paris, in 2005.[19] Bringing together 400 works of art, *Sons & lumières* offered, "a history of the interaction between music and sound and the visual arts." The exhibition was organised around three major themes:

(1) *Correspondences*: abstraction, colour music, light in motion,
(2) *Imprints*: conversion, synthesis, remnants, and
(3) *Ruptures*: chance, noise, silence.

To cite the exhibition leaflet: "In his poem *Correspondences*, Baudelaire writes that 'perfumes, colours, tones answer each other.' The twentieth century, often

18 Cf. Hess-Lüttich 1982a, 1982b, 1999.
19 Centre Pompidou, Paris, 22 September 2004 – 3 January 2005.

characterised as a period of convergence and dialogue among the arts, offers many instances where such a parallelism has been invoked. With the rise of abstraction around 1910, painting sought correspondences with music which was considered to be the abstract art par excellence. At the same time, the new media made possible by the development of electricity, took up the same quest." The same exhibition leaflet summarizes the artistic developments of the 20th century as follows:

> Throughout the last century, cinema and video, the arts of light, offered particularly fruitful ground for the encounter between image and sound. While creative practice was nourished by critical reflections on a supposed equivalence between sight and hearing, the artistic procedures of new approaches to music as performance – incorporating such notions as chance, non-hierarchical sound, and silence – put the idea of correspondence into question. To the question raised by Romantic aesthetics and later by the Symbolist generation – "Can images be rendered in sound, and sound in images?" – the art of [the] twentieth century offers many different and contrasting answers, some seeing in this possibility something of the utopian, others the pure pleasure of the senses.

GESAMTKUNSTWERK

The classic *Gesamtkunstwerk* approach to the experience of art elaborated on by composer Richard Wagner (1813–1883) – the idea of a massive work of art that combines and shakes different senses – closely resembles synesthesia, multimodality and multi-channelling. The Russian composer Alexander Scriabin (1872–1915), who represents Romanticism, can also be mentioned here – especially his works at the beginning of the 20th century expressing mysticism and ecstacy.

Two of the most notable renewers of audiovisual media culture in the 20th century have been Russian film director Sergei Eisenstein (1898–1948) and French film director Jean-Luc Godard (1930–) whose thinking and audiovisual works also contain relevant elements regarding synesthesia, multimodality and hypermediality.[20] Some other relevant names of avant-gardists and innovators include Abel Gance (1889–1981), Walther Ruttmann (1887–1941), Len Lye (1901–1980), Oskar Fischinger (1900–1967), Kenneth Anger (1930–) and Walt Disney (1901–1966).[21]

Synesthesia, multimodality and hypermediality are a relevant field, for example, in the context of *music videos*, which is an organic part of today's popular culture. It can be said that the most important feature of a music video is the link it activates between the senses: making sound visual, and movement and colour audible. There are several justifications for calling music videos "imagined music." The director and writer of a video creates powerful and enjoyable *sensory experiences* – to illustrate the musical piece with old, existing synesthetic associations and create new forms of audiovisual combinations.

20 Cf. Ylä-Kotola 1999, 2001.

21 See, for example, Manovich 2001; Inkinen 2005.

This starting point partly explains why the best and most ambitious music videos represented the aesthetic *avant-garde* of the 1980s and 1990s. Synesthesia explains a lot about the enjoyability of music videos and other forms of audiovisual/multimodal media culture. It can be said that the visual pleasure of music videos is not so much connected with narrativity as with making television more musical.[22]

FINALLY: GAMES AS AVANT-GARDE

How about the aesthetic avant-garde of the present age? And what about extending experiences? Synesthesia, multimodality and hypermediality are also a relevant field in the context of the game world.

Words are, on the other hand, some kind of viruses. While in the 1980s, the "microcomputer" and in the 1990s, the "Internet" and "mobile phone" were the mantras of the day, in recent years, attention has turned to the "mobile Internet" and "computer games." Can massively multiplayer online games (*World of Warcraft*, *EVE Online* etc.), virtual environments, interactive simulations and other examples of digital media be considered to be the "Gesamtkunstwerk" of our age? Many believe they can. More research, however, is needed to illuminate these issues.

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22 Cf. Kaplan 1987; Goodwin 1993; Vernallis 1998.

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PART ONE

Experiential Structures of Play

INTRODUCTION TO PART ONE

Without the player, games would be static and lifeless. A game cannot be understood in its wholeness without acknowledging the existence of the player. For many purposes, such as understanding the rules or semiotic structures of a game, it may be enough to see players as reduced to the consequences of their choices. Making sense of their experiences, however, requires that one sees the player as a living, embodied and situated entity, driven by all sorts of concerns that affect how her experience unfolds.

In discussions regarding game design, the player's experience is sometimes seen as something that can be pinned down rather precisely and be defined as a design goal. These debates, often shot through with notions of fun and enjoyment, sometimes mention the concept of "flow," coined by Csikszentmihalyi (1991), as a state of optimal experience where one faces a challenge seen as neither too easy nor too hard. To facilitate such experiences, designers have put notable effort into balancing the difficulty levels of games and ensuring that the player can encounter the kind of challenges she prefers. These attempts are supported by studies which aim to find out if there are groups of players who share similar motivations for playing (see e.g. Bartle, 1996). Game developers' concerns regarding the player's experience also include emotions, which by all means are integral to any experience, and how to usher the player's experience of the game into the emotional direction desired by the designers. Attempts, such as Lazzaro (2004) and Freeman (2004), exist to provide guidelines on how to elicit certain kinds of emotions in the players.

Apart from being taken as a design goal, the player's experience can be seen as an ongoing process coloured with primarily subjective qualities. For Apter (1991), what is played seems less important than play as a means of relating oneself to the surrounding world, as an activity characterised by "voluntariness" and feelings of security. However, human experience is always an experience of something, whether an object, event, or state of affairs residing in one's mind, in reality, or somewhere in between. When it comes to the experience of a computer game player, it seems fair to assume that the game has a noteworthy role in the constitution of the extra-mental part of the player's experience.

Rodriguez (2006), in his approximation of Huizinga's Homo Ludens (1955), points out that the experience of playing, albeit free and self-contained, "essentially unfolds within a structured situation". In Rodriguez's view, "[e]very ludic experience is characterized and individuated with reference to the various rules and resources available to the person" (2006). Thus, the debates on the underlying structures of players' experiences are closely related to similar debates on games. As an analysis of a game is not complete without taking the player into account, a detailed exposition of a player's experience would not only be a list of subjective qualities but, ultimately, also a view into what the game consists of.

The first part of the book, Experiential Structures of Play, draws together critical contemplations on some of the concepts most commonly used to discuss the experience of a computer game player. It adheres to an approach in which both the player and the game are held responsible for the player's experience. In this, the player is understood as a historical, cognitive, psychological, embodied and social being, who voluntarily sets out to play, whereas the game is seen as containing ludic, narrative and social elements.

Drawing on cognitive science, psychology and computer game studies, the chapters in the first part perform theoretical perspectives on player experience and discuss the ways in which player experience can be conceptualized. They explore the relationship between the player and the game, unfolding temporal, conceptual, and causal structures of the player's experience.

The first part begins with Jan-Noël Thon's chapter on immersion as a multidimensional experience. Building on cognitive science, computer game, new media and presence studies, Thon explores what kind of elements in computer games lead to which kinds of immersion. The player's experience of psychological immersion results from a voluntary or involuntary shift of attention and construction of situation models of the game. By identifying different levels of computer game structures to which the player's attention is turned, Thon is able to distinguish between four different dimensions of psychological immersion.

In his chapter, Jussi Holopainen looks at the evolution of games and play from a biological, psychological and physiological approach to player experience, focusing on the playing subject primarily as a psychopathological human being. In his view, engagement with the game leads to an extension of the player's capabilities not unlike the use of a tool. Displacement also happens in a temporal sense; the "thinking ahead" required by most games suggests the projection of self into imagined situations. Holopainen's argument goes beyond displacement; with a baseline in proto-games played by animals, he sees games as caricatures of intentional activities.

Ulf Wilhelmsson's chapter discusses presence and player agency in the narrative experience of playing a computer game. In Wilhelmsson's view, influenced by experientialist cognitive theory, the conceptual system of the human player is closely connected with the configuration of the player's body. He presents the concept of Game Ego, in which player agency is manifested and which acts as an interface between the human player's sensomotoric

capabilities and the game environment. Using the Game Ego as a vehicle, Wilhelmsson draws comparisons between games and narratives.

In the final chapter of Part 1, Laura Vallius, Tomi Kujanpää and Tony Manninen present a dual exposure of roles afforded by multiplayer games and players' motivations for playing. In their view, play is about experiencing a role, seen as a set of behavioural rules for player experience, and the game is the provider of roles for the player. With Yee's model of player motivations, they identify roles provided by two experimental multiplayer games. Overriding any designer's intent and game's guidance, the player's motivation defines the role she takes.

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Jan-Noël Thon

Immersion Revisited: On the Value of a Contested Concept

In the last few years, academic interest in computer games has been rapidly increasing, leading to what Juul describes as "a state of productive chaos" (Juul, 2006, n.p.). On the one hand, the fact that computer games are researched from a wide variety of different perspectives within various disciplines leads to a somewhat 'chaotic' situation with sometimes downright polemic discussions of methodological and epistemological questions. On the other hand, the chaos is productive, as not only the fact that computer game studies have become "an area with its own set of conferences, associations and journals" (Juul, 2006, n.p.), but also the relatively large number of recently published essay collections and handbooks contributing to the academic study of computer games illustrate (e.g., Neitzel, Bopp, & Nohr, 2004; Raessens & Goldstein, 2005; Vorderer & Bryant, 2006; Wardrip-Fruin & Harrigan, 2004; Wolf & Perron, 2003). One of the main reasons for this increasing academic interest in computer games is their commercial success and their sociocultural influence. Although still a relatively new phenomenon, they have become a central part of contemporary popular culture (e.g., Herz, 1997; Poole, 2004). Computer games obviously have a fascinating effect on a large number of players (and an increasing number of researchers) worldwide.

In fact, research on computer games is focusing more and more on the player's experience and there are various different terms and theories that attempt an explanation. One possibility of describing and maybe even explaining significant parts of the experience of playing a computer game is offered by the concept of immersion, which has been applied to computer games (as well as other media) by scholars such as Murray (1997), Ryan (2001), McMahan (2003) or Ermi and Mäyrä (2005) and is also commonly used in computer game design theory (e.g., Rollings & Adams, 2003; Rouse, 2005). However, the concept is not uncontested and the questions of what immersion is and if it is at all sensible to talk of immersion with regard to computer games are not answered uniformly in the emerging field of computer game studies. Immersion has indeed "become an excessively vague, all-inclusive concept" (McMahan, 2003, p. 67), which needs careful re-examination in order to be useful for the analysis of games, players and the playing experience. Building on previous conceptions of immersion as well as on works from cognitive science and computer game studies, the present chapter attempts to develop a

model of immersion that is appropriate for such a purpose. Finally, it has to be emphasized that the approach of this chapter is theoretical rather than empirical, although we borrow terms and concepts from cognitive psychology.

PREVIOUS RESEARCH ON IMMERSION

Murray describes immersion as the pleasurable "experience of being transported to an elaborately simulated place" which results from the "sensation of being surrounded by a completely other reality, as different as water is from air, that takes over all of our attention, our whole perceptual apparatus" (Murray, 1997, p. 98). However, the reader of a novel or the player of a computer game is not literally transported to another place while reading or playing. Hence, it is problematic to rely on the metaphor of transportation for an appropriate description of the experience of immersion (e.g., Ermi & Mäyrä, 2005; McMahan, 2003, p. 76f; Ryan, 2001, p. 93ff; for a critique of the 'immersive fallacy' see Salen & Zimmerman, 2004, pp. 450-455). Nevertheless, the notion that immersion can be described in terms of a shift of attention seems to be central, although we will have to discuss in more detail what exactly is meant by a 'shift of attention' in the context of playing a computer game.

Building on the theory of fictional worlds mainly developed within narratology (e.g., Doležel, 1998; Pavel, 1986), Ryan describes immersion as a process of "recentering" by which "consciousness relocates itself to another world" (Ryan, 2001, p. 103). While her discussion of immersion as a transmedial phenomenon touches on a variety of interesting points, it is especially noteworthy that her conception of immersion entails not only the shift of attention toward a fictional world, but also the construction of a mental representation of that world (Ryan, 2001, p. 110ff). The latter is doubtlessly as important as the former, but Ryan does not go into too much detail on what role these processes play with regard to the computer game player's experience of immersion. Hence, we will also have to discuss in more detail what is meant by the 'construction of a mental representation' in the context of playing a computer game.

While Murray as well as Ryan conceptualise immersion primarily as a shift of attention to narrative fictional worlds, McMahan (2003, p. 68) claims that the player of a computer game can also become immersed in the process of playing itself. Furthermore, she argues that a consistent world that matches the user's expectations and allows him or her to interact with it in a non-trivial way is more relevant for the experience of immersion than big screens and impressive surround-sound (McMahan, 2003, p. 68f). This entails two notions which are of central importance for the purpose of this chapter: Firstly, immersion entails more than a shift of attention to the three-dimensional space or the unfolding story of a computer game. Secondly, what is presented is more important than how it is presented with regard to a computer game's ability of letting its players experience immersion.

Furthermore, it has to be noted that McMahan is not exclusively concerned with immersion. Instead, she introduces the concept of presence "as the basis

for developing of a set of aesthetic criteria for analyzing 3-D video game design" (McMahan, 2003, p. 68). According to IJsselsteijn and Riva, presence can be defined as "the feeling of 'being there'" (IJsselsteijn & Riva, 2003, p. 5), i.e. the experience of being present in the three-dimensional environment that is created by a virtual reality application or a computer game. The similarity to Murray's description of immersion is obvious (including the problematic use of the metaphor of transportation), and McMahan is not alone in claiming that the two concepts are often used interchangeably (e.g., Ermi & Mäyrä, 2005; McMahan, 2003, p. 70). Nevertheless, it has to be stressed that within the context of presence research, the term 'immersion' mainly refers to "the degree to which a virtual environment submerges the perceptual system of the user" (Biocca & Delaney, 1995, p. 57).

The concept of presence is now commonly applied to computer games (Tamborini & Skalski, 2006), and it would be possible to use the term 'presence' when referring to the player experience and the term 'immersion' when referring to the question to what extent the presentation "takes over [...] our whole perceptual apparatus" (Murray, 1997, p. 98). However, since the purpose of this chapter is the re-examination and more precise definition of the concept of immersion as it is used within computer game studies (as opposed to how it is used within presence research), we will instead distinguish between perceptual and psychological immersion (Lombard & Ditton, 1997; McMahan, 2003, p. 77f). According to McMahan, perceptual immersion "is accomplished by blocking as many of the senses as possible to the outside world" (2003, p. 77). In contrast, it has become clear from the above that psychological immersion in computer games is largely independent from perceptual immersion (although it is obviously not independent from perception) and can be described in terms of a shift of attention from the real environment to certain parts of the game and the construction of a mental representation of the latter.

IMMERSION, ATTENTION, AND SITUATION MODELS

Not unlike immersion, both the notion of a shift of attention to and that of the construction of a mental representation of the media content are often used in a rather vague way in the literature on immersion. Hence, they also need to be carefully examined in order to be helpful for the development of an appropriate model of immersion. Fortunately, there is a large body of research within cognitive psychology that is concerned with these processes. While the present chapter cannot hope to discuss exhaustively the research in question, it seems necessary to review at least some of its findings in order to develop an appropriate concept of psychological immersion without having to rely on the metaphor of transportation. However, our aim is not a general discussion of these processes, but rather an examination of the role they play in the computer game player's experience of immersion.

While a "formal definition of the term 'attention' is not presently available" (Pashler & Johnston, 1998, p. 156), it is normally used to refer to proc-

esses of selection with regard to perception and/or cognitive processing of perceived stimuli. According to Yantis, "[a] major distinction that has guided research in this area [...] is whether attention is goal-driven, controlled in a 'top-down' fashion, or stimulus-driven, controlled in a 'bottom-up' fashion" (1998, p. 223). Similarly, Posner distinguishes between "exogenous (reflexive) and endogenous (central) control of orienting" (1980, p. 19). It seems that a shift of attention is often a voluntary decision (i.e. computer game players decide to shift their attention to the game or certain parts of the game when playing), but certain stimuli can also 'involuntarily' draw attention to them (i.e. certain parts of the game or its presentation may 'capture' the player's attention). While we are mainly concerned with psychological immersion, it may be noted that a high degree of perceptual immersion (though not necessarily leading to psychological immersion) would block stimuli from the real environment, thereby preventing an exogenous shift of attention away from the computer game.

We have seen that attention shifts can be goal-driven (i.e. endogenous shifts of attention) or stimulus-driven (i.e. exogenous shifts of attention), but it is still not clear what parts of the game the player shifts his or her attention to. At first glance, it seems that attention is shifted to the audiovisual presentation of the game. However, Allport suggests that our perceptual experience is "predominantly structured in terms of objects and the actions and events in which they take part" (Allport, 1987, p. 412). Furthermore, it may be noted that attention plays a role not only in perception, but also in the control of action (e.g., Allport, 1987; Norman & Shallice, 1986). Hence, a more accurate conceptualisation would be that the player of a computer game shifts his or her attention not only to the audiovisual presentation of the game, but also (and more importantly) to the presented objects themselves, as well as the events and actions (including the player's interaction with the game) that are connected to these objects. Furthermore, it can be assumed that the main function of attention is the selection of those objects, events and actions that are relevant for the player's "immediate and future action" (Allport, 1987, p. 412). This also includes "internal actions" (Norman & Shallice, 1986, p. 1) such as the player's 'construction of a mental representation' in the process of playing.

Hogan claims that "[w]henever we try to deal with any aspect of the world in any way, we necessarily form a model of that aspect of the world" (Hogan, 2003, p. 40). Hence, it is possible to describe the 'construction of a mental representation' as a process of model construction. There are some interesting attempts within presence research to describe the experience of (spatial) presence in terms of both a shift of attention and the construction of models. Schubert and Regenbrecht claim that,

> [i]n the process of developing presence, a mental model of the virtual three-dimensional space is constructed, consisting of the possible actions in this space (Schubert & Regenbrecht, 2001, p. 4).

This seems to be fairly consistent with our conception of (psychological) immersion, but the term 'mental model' (e.g., Garnham, 1997; Johnson-Laird, 1983) is slightly too general for our purpose. Wirth and his colleagues (2006) describe basically the same process as the construction of a (spatial) situation model. It seems that the latter term is more appropriate for the purpose of the present chapter, since a situation model "concerns the environment in which we are acting" (Hogan, 2003, p. 40) and is constructed while we are acting within that environment.

We propose to conceptualise the computer game player's experience of psychological immersion as resulting from a shift of attention to and the construction of situation models of certain parts of the game. The shift of attention is mainly goal-directed (i.e. endogenous), but certain properties of a computer game, such as objects that move suddenly, may also lead to a shift of attention that is at least partly stimulus-directed (i.e. exogenous). Furthermore, it has become clear from our review of previous conceptions of immersion as well as from our discussion of the function of attention as selection for action that the situation model a player constructs in the process of playing would have to include more than just the three-dimensional space presented by the game, namely the objects, events and (possible or actual) actions that are relevant for the successful interaction with the game. Furthermore, we will propose that the computer game player constructs additional situation models representing parts of the game that are not directly connected to his or her interaction with it.

TOWARD A MULTIDIMENSIONAL MODEL OF IMMERSION

Immersion as a Multidimensional Experience

This leads us to the question of what the relationship between the specific structure of computer games and the player's experience of immersion is. While Gorfinkel rightly emphasizes that "[i]mmersion is not a property of a game or media text but is an effect that a text produces" (quoted in Salen & Zimmerman, 2004, p. 453), it has become clear that the structural properties of a game are not entirely irrelevant for the player's experience of immersion either. Hence, we are not only interested in how immersion can be described in terms of the shift of attention and the construction of situation models in the process of playing, but also in the different levels of computer game structure that players shift their attention to and construct situation models of, and how these different kinds of structural properties lead to different kinds of experience. In other words, we are interested in the question of what elements of computer games lead to which kinds of immersion.

Both Murray (1997, p. 109) and Ryan (2001, p. 120ff) distinguish between immersion in the presented space and immersion in the unfolding story and it has already been mentioned that McMahan (2003, p. 68) distinguishes between immersion in the narrative world and immersion in the game. Another, more recent model of immersion as a multi-dimensional phenomenon

is proposed by Ermi and Mäyrä (2005), who distinguish between sensory immersion, challenge-based immersion and imaginative immersion. The concept of sensory immersion is similar to that of perceptual immersion and entails the assumption that

> [l]arge screens close to the player's face and powerful sounds easily overpower the sensory information coming from the real world, and the player becomes entirely focused on the game world and its stimuli (Ermi & Mäyrä, 2005, n.p.).

The other two kinds of immersion seem to be largely similar to McMahan's immersion in the narrative world and immersion in the game.

Challenge-based immersion refers to the shift of the player's attention "to sensomotor abilities such as using the controls and reacting fast, and […] to the cognitive challenges" (Ermi & Mäyrä, 2005, n.p.) posed by contemporary computer games. The experience of challenge-based immersion is claimed to be at its strongest, when a "satisfying balance of challenges and abilities" (Ermi & Mäyrä, 2005, n.p.) is achieved. Imaginative immersion refers to the "dimension of game experience in which one becomes absorbed with the stories and the world, or begins to feel for or identify with a game character" (Ermi & Mäyrä, 2005, n.p.). Here, the immersion in the presented space and the immersion in the unfolding story distinguished by both Murray and Ryan are combined. Ermi and Mäyrä acknowledge that "the audiovisual, functional and structural playability" (Ermi & Mäyrä, 2005, n.p.) of a computer game is a prerequisite for immersion, but they do not go into too much detail with regard to what properties of a computer game lead to what kinds of immersion.

Based on a general model of computer game structure developed elsewhere (Thon, 2006; Thon, 2007), we propose a slightly different model of immersion as a multidimensional experience (Thon, 2006a). The model of computer game structure has mainly been developed with regard to avatar-based games presenting three-dimensional spaces and our discussion of immersion also primarily aims at these kinds of games. We distinguish between four levels of computer game structure, namely the levels of spatial, ludic, narrative and social structure. The level of spatial structure refers to the game space and the objects therein. The level of ludic structure refers to the rules of the game as well as their effects. The level of narrative structure refers to the stories many contemporary games present using a variety of narrative techniques. The level of social structure refers to the communicative devices that allow for communication and social interaction between the players and the social space that is thereby constituted. These different levels of computer game structure are closely connected to the experience of spatial, ludic, narrative and social immersion.

While concepts similar to these kinds of immersion can be found in most of the works discussed above, and the notions of spatial and social presence play a central role within presence research, it seems that no other model of

immersion in computer games exists that entails all four of them. In the following, we will briefly discuss how the different kinds of immersion can be understood in terms of the computer game player's shift of attention to the different levels of computer game structure and the construction of different kinds of situation models that represent certain parts of this structure. While we are using concepts from cognitive psychology, our approach is still mainly theoretical (i.e. the aim of this chapter is to propose a model that allows for a description of different kinds of immersion and not to empirically verify the proposed model). Furthermore, it has to be emphasized that the fascinating experience of playing a computer game results from the combination of the four kinds of immersion that are examined separately in this chapter. Therefore, the relationship between them will have to be at least touched upon.

Spatial Immersion

Many contemporary computer games are set in complex fictional worlds (e.g., Juul, 2005; Thon, 2007). With regard to the spatial structure of these games, one can distinguish between the whole space of the fictional world and those spaces that the player can interact with through his or her avatar (or through the interface in games not using an avatar). Juul draws a similar distinction between "world space" and "game space" (Juul, 2005, pp. 164-167), which we will use in the following. With regard to computer games, spatial immersion can be described in terms of the player's shift of attention from his or her real environment to the game spaces (not including these parts of the world space that are presented narratively). Furthermore, it refers to the construction of a model of the "gaming situation" (Eskelinen, 2001) in the process of playing, which will entail at least those parts of the game space that are relevant for the player's actions (see also the large body of research on spatial presence, e.g., Schubert & Regenbrecht, 2001; Tamborini & Skalski, 2006; Wirth *et al.*, 2006).

In many contemporary computer games, game spaces are three-dimensional environments in which the player can more or less freely move the avatar as well as the point from which the space is presented. Such game spaces can, for example, be found in first-person shooter games such as *Halo* (2003), in which they are presented from the position of the avatar. Rouse (1999) is not alone in claiming that such a presentation of the game space leads to the player being "drawn into the game" (Rouse, 1999, n.p.). Apart from the problematic use of the metaphor of transportation, it may be noted that games such as *World of Warcraft* (2004) present the game space from a position above and behind the avatar without thereby preventing the player from experiencing spatial immersion. In fact, *World of Warcraft* allows the player to change the default perspective so that the position from which the game space is presented coincides with the avatar's position once more. Although most players of *World of Warcraft* still use the default perspective (or zoom out even more), the tendency of contemporary computer games to allow their players to change the perspective seems to further confirm the assumption

that spatial immersion can be experienced independent of the point of view from which the game space is presented (Thon 2006b).

However, a certain consistency in the presentation of the game space is necessary for spatial immersion to occur (McMahan, 2003). Wolf (2001) notes that the game spaces of contemporary computer games are often presented according to the conventions of space representation in classic Hollywood film. The resulting impression of "spatial consistency" (Wolf, 2001, p. 66) is important for the experience of spatial immersion, since it allows the player to construct a consistent model of the game space. While those parts of the game space that are relevant for successful action will form especially salient parts of the situation model, spatial immersion does not primarily refer to a shift of attention to the interaction with the game space. The possibility for interaction increases the spatial immersion of a player, but interaction here mainly refers to the exploration of the game spaces (Aarseth, 1997, p. 64). This leaves open the question of how the other parts of the player's interaction with the game can be described and to what kind(s) of immersion they lead.

Ludic Immersion

The situation model that the player constructs in the process of playing will contain not only information about the dimensions of the game space and the positions of the various objects within it, but also information about the possibilities for interaction. The freedom of action that computer games often suggest is restricted not only by the spatial borders of the game space but also by the rules of the game that form its ludic structure (Thon, 2006; Thon, 2007). It is equally true for single- as well as for multiplayer first-person shooter games that the possible movements of the avatar are determined by the game rules. Running, jumping, and crouching as well as picking up and using a wide variety of weapons are essential abilities of the avatar in a first-person shooter like *Halo*. Similarly, the avatar in a MMORPG like *World of Warcraft* may have certain abilities that go beyond the basic movements, including fighting skills with melee as well as ranged weapons and a variety of magic skills, ranging from deadly fireballs to powerful healing. Although 'interaction' is yet another vague and all-inclusive term (e.g. Manninen, 2001), we use it in the following mainly to refer to the player's actions that result in actions of the avatar and/or a change of state of the various objects in the game space.

Ludic immersion can be described in terms of a shift of the player's attention to the interaction with the game and the construction of a situation model that contains not only the relevant elements of the game space, but also the possibilities for action within it. While both the spatial and ludic structure of a computer game will be at least partly represented in the model of the gaming situation that the player constructs in the process of playing, spatial and ludic immersion differ significantly with regard to which parts of the game attention is shifted to. However, it has to be emphasized that spatial and ludic immersion are closely connected and will often occur at the same time. Spatial

immersion is the experience of the game as presenting spaces, the attention is shifted to the game spaces that the game presents. Ludic immersion, on the other hand, is mainly experienced through the various kinds of challenges that computer games confront their players with and which form an essential part of the playing experience (Rollings & Adams, 2003; Ermi & Mäyrä, 2005). The attention is shifted to the player's interaction with the game (i.e. to the control of the avatar in the avatar-based games discussed above).

Various researchers have used the concept of flow developed by Csikszentmihalyi (1990) to describe this part of the playing experience (e.g. Ermi & Mäyrä, 2005; Järvinen, Heliö, & Mäyrä, 2002; Sweetser & Wyeth, 2005). Flow is experienced when the difficulty of an activity matches a person's abilities. Csikszentmihalyi notes that

> [w]hen all a person's relevant skills are needed to cope with the challenges of a situation, that person's attention is completely absorbed by the activity (Csikszentmihalyi, 1990, p. 53).

This is precisely what happens when the player of a computer game experiences ludic immersion. Attention is shifted mainly to those elements (i.e. objects, events, and actions) in the game spaces that are relevant with regard to the challenging activity of playing the game as well as to the activity itself. While the kind of immersion that a player experiences will vary depending on the player, the game, and the specific part of the game, it can still be assumed that most players will experience both spatial and ludic immersion while playing. However, these are not the only kinds of immersion that player's may experience.

Narrative Immersion

Many contemporary computer games use a variety of narrative techniques such as cut-scenes or predetermined sequences of events within the game spaces to convey stories that are relatively complex at least compared to earlier games. While the present chapter cannot discuss the complicated question of narrativity in computer games in any detail (e.g. Eskelinen, 2004; Jenkins, 2004; Neitzel, 2005; Ryan, 2006; Thon, 2007), it may at least be noted that one can distinguish between two kinds of events in computer games, namely narrative and ludic events. Narrative events are determined before the game is played and are presented using the various narrative techniques already mentioned. Ludic events are presentations of events that are determined at the moment of their presentation. The mode in which the latter are presented is that of simulation, not that of narration (e.g., Aarseth, 2004; Frasca, 2003; Ryan, 2006, pp. 181-203; Thon, 2006b; Thon, 2007).

What we propose to call narrative immersion refers to the player's shift of attention to the unfolding of the story of the game and the characters therein as well as to the construction of a situation model representing not only the various characters and narrative events, but also the fictional game world as a

whole (e.g., Ermi & Mäyrä, 2005; Juul, 2005; Ryan, 2001). Its construction will probably not differ too much from the construction of a situation model by the spectator of a narrative film, since spectators and players alike are trying to "reconstruct the story from the discourse" (Hogan, 2003, p. 116). However, it has to be emphasized that the narrative situation model entails not only narrative events, but also certain ludic events (as far as they are relevant for the game's story) and a representation of certain parts of the various game spaces. Nevertheless, it can be assumed that in many games the narrative situation model is constructed relatively independently from the model of the gaming situation. As Ryan has rightly observed, there are large passages of time in most contemporary games where "the narrative design is not the focus of the player's attention" (Ryan, 2006, p. 196).

However, when players shift their attention to the narrative structure of the game, they will experience narrative immersion. Ryan (2001, p. 140ff) distinguishes between temporal and emotional immersion. Temporal immersion refers to the experience of suspense, i.e. the shift of attention to the unfolding of the story. Emotional immersion refers to the experience of empathy, i.e. the shift of attention to the fate of certain characters in a story. While the story of *Halo* is not exactly a masterpiece of contemporary storytelling, there may well be more than one player who has played through the singleplayer mode mainly to find out about its ending. This "desire for the knowledge that awaits her at the end of narrative time" (Ryan, 2001, p. 140) plays a central role in the player's experience of narrative immersion. Genuine empathy with computer game characters is less common (e.g., Neitzel, 2004; Schirra & Carl-McGrath, 2002), but it can contribute to the experience of narrative immersion as well. It may also be noted that the perception of characters in computer games is sometimes connected to what we propose to call social immersion.

Social Immersion

In the multiplayer modes of first-person shooter games, there is no narrative framework that guides the player's actions. Instead,

> a social environment [is] formed at the intersection of the text of the game, the specific rules of whichever game modification the server may be running and the presence of other human participants, who may communicate with each other during the game by typing (Morris, 2002, p. 84).

The game spaces function as arenas, in which the players let their respective avatars fight against each other in a variety of different game modes. Narrative elements are substituted by communication and social interaction of the players with each other. In MMORPGs such as *World of Warcraft*, communication and social interaction of the players with each other take place in a rich fictional world and are combined with a non-linear narrative structure. In these games, communication and social interaction may additionally intensify players' experience of narrative immersion.

While it is beyond the scope of this chapter to discuss the complex social structure and social context of first-person shooter games and MMORPGs in detail (e.g., Axelsson & Regan, 2006; Morris, 2004; Smith & Sicart, 2004; Thon, 2006), it can nevertheless be assumed that both genres allow their players to experience social immersion, which can (once more) be described in terms of a shift of attention to the other players as social actors and the relationship between them, and the construction of a situation model of the social space that is constituted through the communication and social interaction between the players. It also has to be noted that a very similar concept, namely that of social presence, has been developed within presence research (e.g. Biocca, Harms, & Burgoon, 2003; Tamborini & Skalski, 2006). This research also extensively discusses the relation between the structural properties of media and the social presence that they lead to, i.e. "how changes in properties of media interfaces affect social presence" (Tamborini & Skalski, 2006, p. 231).

While it seems likely that a model of the social situation is, again, constructed relatively independently from the gaming situation model and the narrative situation model, it is also obvious that these models are partly connected to each other just as the kinds of immersion distinguished in this chapter tend to converge in the actual playing experience. It has already been mentioned that the player-controlled avatars can, to a certain extent, be perceived not only as social actors but also as narrative agents. Here, a strong sense of social immersion may lead to a more intense experience of narrative immersion (and *vice versa,* as the phenomenon of parasocial interaction suggests (Hartmann, Klimmt, & Vorderer 2001)). Furthermore, communication and interaction play a central role with regard to the ludic structure of multiplayer games in that they make cooperative action possible (Thon, 2006), and a strong sense of social immersion may lead to a more intense experience of ludic immersion through the introduction of social competition (Vorderer, Hartman, & Klimmt, 2006). While this chapter cannot discuss the influence that the different kinds of immersion have on each other in more detail, it hopefully has become clear that this question is of central importance and should be further addressed by future research.

CONCLUSION

The conceptualisation of immersion as a multidimensional experience proposed in this chapter means that the term entails far more than perceptual immersion. While an understanding of the concept as referring to various forms of psychological immersion is relatively common within computer game studies, it makes a clear distinction between the different kinds of immersion necessary if one wants to avoid ending up with "an excessively vague, all-inclusive concept" (McMahan, 2003, p. 67). We have proposed to distinguish between spatial, ludic, narrative and social immersion in this chapter, briefly describing each kind of immersion in terms of the player's shift of attention and construction of situation models. However, it has also become clear that there are various other ways in which these kinds of experience could be described.

Spatial immersion, i.e. the shift of the player's attention to and his or her construction of a situation model of the game spaces, is very similar to the concept of spatial presence. Ludic immersion as the shift of the player's attention to the interaction with the game occurs when the abilities of the player and the level of challenge of the game are balanced and could also be described using the concept of flow. Narrative immersion as the shift of the player's attention to the future development of the story and the characters in it could also be described using terms such as 'suspense' and 'empathy'. Finally, social immersion as the shift of the player's attention to and his or her construction of a situation model of the social space is very similar to the concept of social presence. It would clearly be possible to reserve the term 'immersion' for perceptual immersion and describe what we have discussed as dimensions of psychological immersion using different terminology.

However, it has again to be emphasized that in computer game studies, the term 'immersion' is often used in a way that includes more than just perceptual immersion. In this situation, a distinction of different kinds of immersion seems necessary for reasons of terminological clarity, if nothing else. Another advantage of our approach is that it highlights the similarities and connections between phenomena that otherwise would be (and indeed often are) treated separately. The proposed model certainly lacks empirical proof and there is also much left to do both with regard to the relationship between computer game structure and the experience of different kinds of immersion as well as with regard to the various interrelations between the latter. Nonetheless, it seems that the distinction between its spatial, ludic, narrative and social dimensions allows for an appropriate description of the player experience that builds on the much-contested concept of immersion.

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Play, Games, and Fun

The basic claims of this chapter are 1) that games are caricatures of intentional activities; 2) that playing games is based on somatic and temporal displacements; and finally 3) that games consist of several layers of predictive and dramatic closures. These three basic concepts of engaging with games are used to trace the evolution from play to playing games and games in general. Note, however, that the principles presented here do not explain the whole basis of playing games; they are just a small subset of a large number of similar principles for guiding our understanding of why playing games can be so engaging or fun. It is important to make the distinction between pure, or "free" play, and games with codified rules. The former is observed in virtually all mammals, in some species of birds and even reptilians and fish, while the latter appears to be exclusively confined to us humans. For more thorough discussions on the distinction see, for example, Salen and Zimmerman (2003) and Juul (2005).

Games are caricatures on several different levels. The most basic levels are that of representation, actions available for players, and goal structures that guide the players' intentions. The caricatures are, by definition, exaggerated and simplified forms and structures of everyday being in the world. The forms and structures found on the representation layer are similar to that found in other representational arts (Ramachandran & Hirstein, 1999), for example, painting and sculpture. The painting even on the most realistic end of the spectrum leaves out features of the lived world and exaggerates at least in some form the salient features the painting wants to address. Take as an example a landscape painting by John Constable. The pastoral landscape as a setting is "realistic" and familiar but the forms used to depict and express the landscape are both exaggerations (to a limited extent) and simplifications of what could really be seen if one was viewing the real landscape.

These features reflect well the characteristics what Ramachandran and Hirstein (1999) claim to be some of the central characteristics of understanding representational art as caricatures. These central characteristics are: the peak shift effect, that perceptual grouping and binding is directly reinforcing, and that contrast extraction is reinforcing.

The peak shift effect is a principle in animal learning. If an animal is taught to discriminate square from a rectangle, the animal's response to a rectangle

which is longer and thinner than the original one is even stronger. This means that the animal is not learning a prototype but a rule, in this case the rule of discriminating rectangles from squares. Ramachandran and Hirstein claim that this is one of the principles of how human aesthetic experience is constructed.

Perceptual grouping and binding is essential to discover and delineate objects in the visual field and this relies on extracting correlations. The process of finding out these correlations in order to discover objects in the environment is essentially reinforcing for the organism, otherwise there would be no incentive for going through such a cumbersome and complicated process.

Contrast extraction is in itself necessary for achieving perceptual grouping. The contrasts or the edges are important clues to allocate attention to interesting features in the environment and this, at least in some cases according to Ramachandran and Hirstein, may imply that these features are also 'pleasurable'. The contrast principle not only applies to the basic visual perception such as colour and motion but can be extended to more abstract and conceptual features.

The visual arts have used and use these principles in composing engaging experiences and the representational layer of games follows the same principles. Consider the visual contrasts of black and white in chess board and also the pieces: the black and white squares provide enjoyable low level visual contrast while the more abstract contrast of black player against the white player is represented by the pieces themselves. The positions of the chess pieces on the squares and their shapes follow the caricature principles of peak shift effect.

The actions available for the player in any given game are simplified, exaggerated and transformed structures, i.e. caricatures, of possible actions in the real world. Continuing with the chess example the actions and their consequences are rigid, crisp, and codified. The player moves the chess pieces from one square to another and the exact position on the square or the manner how which the piece is moved is of no consequence for how the game unfolds. The same applies to evaluating the consequences of players' actions. The chess piece entering the square captures the opponent's piece on the square. The consequence is clear cut: the captured piece is removed from play and again the exact manner of how the piece is taken out from the board does not have an effect on the outcome of the action from the perspective of the game.

The goal structures of the game give the players the incentive to play the game and also guide their actions during playing. The caricature principle is in effect also for the goals. The game, in principle, brackets of the real world goals of the players and formulate caricatures of real world goals within the game environment or system. The goals in the game are simplified and exaggerated of the certain goals found in our everyday experience. The goal of overcoming the opponent in chess is a highly conceptual caricature of overcoming an opponent or obstacle in the real world using the power of discrete and mobile units with differing strengths.

Tetris (1986) is a good example of how the caricature principle guides the whole design of the game from representational features to possible actions and finally to the goal structures. The representational layer of *Tetris* consists of discrete blocks with clear and crisp boundaries. Even though the colour of the blocks does not effect how the game unfolds but in most versions they are used on the representational layer to enhance to overall experience. The way how the blocks stack up create opportunities and especially missed opportunities for perceptual grouping. The gaps in lines invite the players to fill them in and the closure (see the closure discussion also below) of filling the row is both a pleasing visual experience (the perceptual grouping of the whole line is accomplished) but it is also at the same time one of the basic level goals of the game. The actions and events of *Tetris* are caricatures in themselves. The blocks are falling down (in most of the versions of *Tetris*) simulating in a crude manner the way how gravitation effects objects without support. When the block touches another block it is stacked up, again in a similar fashion what would happen if objects fall upon each other in real world. The actions available for the player are caricatures of basic spatial object manipulation. The player can move the block left or right in discrete steps and the player can rotate the block in 90 degree steps. *Tetris* is, indeed, a prime example of how the different layers of caricatures are tied together to provide a compelling and engaging experience.

Holopainen and Meyers (2000) suggest that many games, especially modern electronic games, exploit the psychological capability of projecting the mental self-image into another physical form. Holopainen & Meyers call this capability somatic displacement. There are two different ways of looking at somatic displacement: first, where the displacement is more or less extension of the body as in tool use; and second, where the displacement is the transferal of the somatic model into an object in the environment. In both cases the potential for controlling the focus of displacement heightens the experience. For example, while playing a third-person action game such as *Tomb Raider* (1996) the experience of somatic displacement focusing on the avatar, Lara Croft, is stronger than when just watching other people play the same game. In a similar fashion the sense of car as an extension of your body is stronger if you are driving it. It can be argued that the somatic displacement is weak in abstract games such as chess or *Tetris* but many players have claimed (the author included) that in these cases the chess or *Tetris* pieces feel like extensions of your self, in other words they are regarded as tools for manipulating the environment in a similar fashion as a spade is an extension of the hand for digging holes in the ground.

The second type of displacement Holopainen and Meyers (2000) discuss in their paper is temporal displacement: the ability to project oneself into hypothetical situations, including the point of view of some one else, i.e. "theory of mind" (Damasio, 1999). The temporal displacement is crucial for playing games, especially those which require strategic thinking. The phenomenon is easy to recognize in chess where the players have to think ahead of their own moves and also the opponent's moves. Temporal displacement seems to be

closely connected to imagination. Persons coming up with hypothetical situations must use imagination at least in some sense. The projection of self into an imagined situation is, then, the function of temporal displacement. The game rules, current game state, the props, the previous "moves" the players have made etc. are features of playing the game which guide the imagination of the players to construct the hypothetical situations needed for temporal displacement.

Although it can be argued that both somatic and temporal displacements are present in every game, it is evident that different game types use the displacements in different ways. As already stated above the temporal displacement component is strongly present in games requiring strategic thinking at least as compared to, for example, quick-paced arcade fighting games such as *Tekken* series (1994-2007). It also seems to be the case that the stronger the somatic displacement the weaker the temporal displacement is in the game. This may be due to the fact that the somatic displacement has a higher priority for the use of the same cognitive structures as the temporal displacement (Banich, 2003). Note, however, that the same game can contain different modes of play where the displacements are used differently. For example, the main mode of play in a side-scroller shooter *Forgotten Worlds* (1988) relies heavily on the somatic displacement as the player has to steer the ship through a hostile environment dodging obstacles and shooting down enemies. Between levels the player can use in-game currency gained during the play to upgrade the ship. Choosing between different upgrades requires strategic thinking and thus temporal displacement.

It is claimed that the sense of closure is one of the most important characteristics of the aesthetic experience of art forms as divergent as painting and drama (Ramachandran & Hirstein, 1999; Grodal, 1999). It is no surprise then that the experience of playing a game is based upon or modulated by the various closure structures within the game itself. Holopainen and Meyers (2000) distinguish between predictive and dramatic closures, although they seem to be somewhat overlapping. Predictive closure as opposed to dramatic closure can be described as lower level and based solely on sensory experience. McCloud (1994) talking about closures in general states: "The phenomenon of observing the parts but perceiving the whole has a name. It's called closure." The predictive closure is evident also in other sensory modalities than just visual. For example, musical tunes, especially if they are familiar, provoke the sense of predictive closure (if the tune is not finished the listener is left in a state of unfulfilment). Visual predictive closures are, however, are more prevalent in games and is closely related to the above mentioned perceptional grouping and binding. The visual predictive closures of *Tetris* are, as mentioned, strong low level incentives for filling in the gaps.

The dramatic closure is often described as the satisfaction arising from the resolution of tension. As the term itself implies this type of closure is found in art and entertainment forms with dramatic elements from stage plays to action movies. In the context of this chapter it is better to mention that dramatic closure is associated with a completion of a task, which is reinforcing in itself

(Reeve, 2004; Grodal, 1999, p. 51). The interplay of dramatic closure and temporal displacement is one of the sources of enjoyment when watching, for example, movies. The hero who finally succeeds in revenging the death of her family completes a task and by temporal displacement we can identify with the enjoyment associated with the completion of the task. Of course, there are many other sources and factors present affecting the final movie experience but it seems that the dramatic closure as a completion of a task is one of the most important factors in enjoyment of games. Dramatic closures occur also when the completion of a task fails or there is a setback, e.g. the player loses a life in *Pac-Man* (1979). The temporal sequencing of the achievement and failure dramatic closures creates the "dramatic experience" in games. As stated above games always have goal structures, which in essence define the tasks the player has to complete in order to progress in the game. In this way the goal structures define the possible structures for dramatic closures. Note here, that even games such as *SimCity* (1989), which do not have a big explicit overarching goal, have a hierarchy of smaller subgoals and the players almost always construct their own bigger goals within the game environment, e.g. build a big city without law enforcement.

Virtually every game consists of several layers of dramatic closures (Falstein, 1999). In *Tetris*, for example, the lowest achievement and failure closures are related to putting the block in a proper place. The next achievement closure is, of course, filling in a full row of blocks thus removing the line from the screen and increasing the player's score. It is intriguing to note that there is no final achievement closure in the game; the player is always overwhelmed by the falling blocks in the end. This might be one of the reasons for the addictiveness of *Tetris* as you can never complete the task of winning *Tetris*. It is also a well known fact from psychology that it is easier to remember unfinished tasks than finished ones (Reeve, 2004). This means that the task of "finishing" *Tetris* lingers in the player's memory and can be an unconscious motivation for playing *Tetris* again.

ABOUT PLAY AND GAMES

Play has been, and still is even after a more than a century of studies, an elusive concept with a multitude of diverging (and sometimes converging) theories, definitions and approaches. Sutton-Smith (1997) in his Ambiguity of Play tries

> to bring some coherence to the ambiguous field of play theory by suggesting that some of the chaos to be found there is due to the lack of clarity about the popular cultural rhetorics that underlie the various play theories and play terms.

The seven rhetorics proposed by Sutton-Smith are:

1. The rhetoric of play as progress, which states that animals and children adapt and develop during play in order to prepare for the adult life.
2. The rhetoric of play as fate where the choices and outcomes of our actions are dictated by destiny, luck or what ever.
3. The rhetoric of play as power which sees play as a representation of conflict and as a way to establish and enforce the power status of the winning players.
4. The rhetoric of play as identity as "a means of confirming, maintaining, or advancing the power and identity of the community of players" (Sutton-Smith 1997, p. 10).
5. The rhetoric of play as the imaginary as applied to creativity and "playful improvisation" in arts and other aspects of life.
6. The rhetoric of self where the focus is on the enjoyment or fun aspect of the participating players themselves.
7. The rhetoric of play as frivolous as in cases where play is regarded as something unnecessary, even foolish.

The current discussion is focusing on the rhetorics of self as we are trying to tackle the issue of fun in games, although the rhetorics of progress, power, and imaginary are also relevant when discussing the possible biological functions of play, sports, and roleplaying games.

Sutton-Smith's seven rhetorics give us an overview of how one can approach games but leave us unable to define play. Burghardt (2005) has proposed five criteria to distinguish play from other kinds of activities. Burghardt claims that "all five criteria must be met in at least one respect before the play label can be confidentially attached to any specific instance of behaviour" (Burghardt, p. 79). Burghardt's criteria are:

1. […] the performance of the behavior is not fully functional in the form or context in which it is expressed; that is, it includes elements, or is directed towards stimuli, that do not contribute to current survival.
2. […] that the behavior is spontaneous, voluntary, intentional, pleasurable, rewarding, reinforcing, or autotelic.
3. […] that it differs from the 'serious' performance of ethotypic behavior structurally or temporally in at least one respect: it is incomplete (generally through inhibited or dropped final elements), exaggerated, awkward, or precocious; or it involves behavior patterns with modified form, sequencing or targeting.
4. […] the behavior is performed repeatedly in a similar, but not rigidly stereotyped, form during at least a portion of animal's ontogeny.
5. […] the behavior is initiated when an animal is adequately fed, healthy, and free from stress (e.g. predator threat, harsh microclimate, social instability) or intense competing systems (e.g., feeding, mating, predator avoidance). In other words, the animal is in a 'relaxed field'.

The second, third, and fourth criteria are important for the current discussion. The second and third criteria, that the behaviour is pleasurable, rewarding or

reinforcing and that the behaviour is exaggerated, can be met with the above mentioned principle of peak shift effect concerning both the action itself and the goals of the game. The fourth criterion is evident in games as the main mode of play is usually characterized by repeated similar, but not stereotypical, actions performed by the player in order to reach the different levels of goals of the game. In *Tetris*, for example, the player repeatedly places the blocks by moving them left to right and rotating them in order to fill in horizontal lines. The first and the fifth criteria are at the same time obvious and problematic in the case of games. Playing games is something, which does not contribute to the immediate survival although gambling and professional sports contradict this. Game playing happens normally outside the normal pressures of everyday life but at the same time playing a quick game of *Minesweeper* (1991) during work hours can be used for alleviating the stress of the workplace; the player brackets off the stressful environment by playing the game.

Free play is still too amorphous to be fully caught in the caricature analysis. The exaggerated and "useless" movements, awkward positions, and modified action sequences can be explained as caricatures of the actions themselves, but as according to the definition of free play the clear goal structures are still missing. More game-like play behaviour such as playfighting (rat pups) and chasing (dogs) have implicit goals of overcome and contact and it is clear from the behaviour of the animals that there are winners in these protogames. In both cases of playfighing and chasing the "losing" animal clearly indicates that the winning condition has been met, i.e. there has been a failure closure. Here we can see the seeds for explicit and codified games we humans play. The goal structures even in these protogames can be analysed according to analytical tools, such as game design patterns of Björk and Holopainen (2004) used for describing human games. The section in Björk and Holopainen describing goals and goal structures include such patterns as Overcome, Exploration, and Contact which appear in many cases of animal play behaviour.

Sports

Playful physical competition between people has occurred for as long as we have recorded history, and the play of young animals and the formalized combat in mating rituals can be seen as closely related natural play activities. Sports use the physical abilities of the participants to determine the outcome of the activity, and many sports are based on the definition of how to use a specific ability, e.g. 100 meter dash, the long jump, or wrestling. Indeed, the aim of sports can be described as a way to judge which player is better than the others in that specific ability. The sports are, as play behaviour in general, caricatures of intentional activities. The 100 meter dash simplifies and exaggerates the everyday behaviour of running. The track is exactly 100 meters long and straight, the competitors start at the same place and the same time, and the goal is to cross the finishing line as fast as possibly. The same principles apply to wrestling, which seems to be a direct descendant from rough-and-tumble or playfighting. Burghardt's third criterion, that the action is incomplete, is

codified (and caricaturized) as a winning condition. The player forcing the opponent to fall wins the game and the seemingly aggressive behaviour of overcoming the opponent ceases. The activity and behaviour of the wrestlers is remarkably similar to playfighting in young canids (dogs, wolves, foxes) or rats (Fagen, 1981). It can be argued that the wrestler's are not playing any more and that according to the rhetorics of power the contest has lost the innocent spontaneity of play behaviour. This does not undermine the interpretation of wrestling as an evolved form of playfighting, on the contrary, it illuminates one of the mechanics of transforming play into games: valorizing the outcome of the play activity over the activity itself. Team sports from tug-of-war to cricket follow the same principle. Only certain types of actions are allowed (according to the rules) and the lower level goals in more complex team sports are rigidly codified. For example, the low level goal of the soccer is to get the ball into the goal area of the opposing team. Similar goals of Traversal or Delivery (Björk & Holopainen, 2004) are widespread in other team sports involving a focal goal object, such as the ball in soccer.

Games of Chance & Dice Games

Games using the random outcome produced by a game element share the possibility of being the oldest form of games with sports. Derived from the objects used in divination (e.g. the *I Ching*) the elements started to be used for more earthly matters. Since games using dice or binary lots have few other game elements, most noticeable the absence of written rules, little is know about the earliest dice-only games. Knizia states that dice games were played since the origin of civilization but does not provide examples (Knizia, 1999). Parlett provides no examples of pure dice games but does provide some examples of randomizers in early games: five staves constructed to function as randomizes were found in Tutankhamen's tomb (from ca 1323 BC) together with a gameboard; three similar staves were found in the royal tombs at Ur together with another gameboard; and the Rig Veda from approximately 1500 BC confirmed the use of randomizers to "cause delight" in ancient India (Parlett, 1999, p. 21-22).

The first game elements used for these types of games are called binary lots, simple objects that can be shaken, thrown or otherwise have their physical location changed in an unpredictable way. Binary lots are still used in the practice of flipping a coin to generate a heads or tails result. According to Herodotus the "normal" dice, the six-sided cubical die omnipresent in non-computerized games today, were invented by the Lydians of Asia (Parlett, 1999, p. 27). Predecessors to these, Astragals, produce one of four numbers (typically not 1,2,3,4) have been depicted 800 BC, and their use has been confirmed by classical writers and finding in royal graves in Palestine (Parlett, 1999, p. 25).

The use of dice and other randomizers in games introduce several aspects to gameplay. Instead of relying on physical abilities, players rely on chance, making the actions of the game impartial to what player performed the action

(following the rhetorics of fate it is still common for players to see destiny or the will of gods in the results).

These early games indicate the point in the evolution from play to games where the physical activity itself is on the background and the focus is on the outcome of the codified and caricaturized action. In the case of dice games the action is simple: throw the dice and the outcome of the action is more important than the action itself. The caricature principle is evident in dice games on many levels. The action is simplified and abstracted, the player can, according to the rules, do only one type of action; the possible outcomes are discrete; players take explicit turns to perform their actions; the final outcome is explicitly calculated from the outcomes of each individual player; and as the outcomes are discrete the sense of closure is heightened accordingly. The dice games are also the first examples of how the natural play behaviour is changed into symbolic behaviour. The dice and the possible outcomes stand for something else than they are requiring symbolic thought and are the seed for games requiring somatic and temporal displacements.

Board Games

Although difficult to prove, the beginning of board games can be traced to the need of having a way to keep track of player's scores in dice games (Parlett, 1999, p. 35-36). From using a board with game pieces that were moved as player gained score points, the change to making the movement of the pieces important gameplay activity was small. By offering players choices of how to do movement, typically having more than one piece and being able to choose which piece to move, tactic choice became possible, and game skill could become a success factor together with luck (Parlett, p. 36).

Race games can be seen as an evolution from dice games toward board games. Parlett gives no exact date for the earliest race games but writes "all cultures that have games at all have race games, and […] of extremely ancient date" (Parlett, p. 35). Race games, especially games where there is only one piece moving, are examples of first games with strong somatic displacement component.

Pachisi (Parlett, p. 42), the Indian game from which *Ludo* originated is one of the oldest racing games. Although the exact date for the appearance of the game is unknown, there is partial evidence from carvings from the 6th or 7th century and references to possible variations of the game claim to have reached China in the third century AD.

Bilateral racing games, with *Backgammon* as the principal example, are a form of games where players start in opposite ends of the race track and race towards the others end. The probable forerunners to modern day *Backgammon* can be traced to the city-state of Ur, and although probably much older, tablets dated to 177/176 BC gives the rules to the ancestor game. The existence of a game with a similar board, the *Game of Twenty* (Parlett, p. 65), has been confirmed to the middle of the second millennium BC. Yet another similar game, *Senet*, (Parlett, p. 89) is shown in a picture in an Egyptian tomb

from 2650 BC. Race games introduced several pieces controlled by one player, in one sense making a player play several games at once, and opened up for player-to-player interaction as the pieces could easier be used for tactical purposes such as blocking or capturing other pieces.

The games have now become symbolic activities but they still retain some of the old structure of play behaviour. The race in Pachisi is a symbolic transformation of moving your own body as fast as possible from one point to another. The additional gameplay features of blocking and capturing have similarly evolved from earlier physical play behaviour.

ELECTRONIC GAMES

Electronic games are those that make use of electronic hardware to store the game state and handle game actions. The history of electronic games starts around 1950's with electronic versions of *Tic-Tac-Toe* and *Tennis for Two* and the games available now have, on the surface, little or no resemblance of the older games. However, new games tend to get build upon the features of the older games and even natural play behaviour and it can be argued that when the slick graphics and awesome sounds are removed the core features of even the most complex current games can be found in the murky past of the evolution of play and games.

Fighting Games

Having a possible origin in boxing simulations, fighting games soon evolved to being duels between characters with various fantastic abilities which challenged players' ability of timing and learning button combinations. As the games progressed from early variants such as *Karate Champ* (1985), *International Karate* (1986), and *Street Fighter* (1987) to the later variants such as *Mortal Kombat* (1992), *Soul Calibur* (1998), *Dead or Alive* (1996), and *Tekken* the games have grown more complex in number of maneuvers and characters as well as in graphical detail.

Fighting games introduced the concept of combos, long sequences of actions that triggered special effects. Some of these combos where described to players in manuals but some of them had to be discovered by experience and experimentation. Another specialty of fighting games was to reward gameplay but unlocking new characters that could be played, a form of meta-reward that was only useable in subsequent games. The main goal of all fighting games still continues to be to overcome the opponent by skillful timing and maneuvering of the character, that is, they rely heavily on the somatic displacement.

Racing Games

Racing games have had a long history in video games. Games such as *Sega Rally* (1995), *Pole Position* (1982) and *Outrun* (1986) have all been popular and driven the evolution of the industry. The development of racing games genre

is represented by two different approaches: the simulations that try to model racing as realistically as possible (*Gran Turismo* series (1997), *Colin McRae Rally* series (1998-), *Need for Speed* series (1994-)) and those that use fantastic settings (*F-Zero GX* (2003), *Wipeout* (1995), *Crazy Taxi* (1999), *Mariokart Double Dash!!* (2003)).

Racing games (together with *BattleZone* (1980)) were the first to have continuous game worlds that were larger than the player could see at once. Besides providing a feeling of spatial immersion, this feature required the introduction of overview maps to show the positions of all participants in the race.

Real-Time Strategy Games

Although the video game *Herzog Zwei* by Sega Enterprises Ltd in 1989 can be seen as the first real-time strategy (RTS) game, the genre became well-known through Westwood's *Dune II* in 1992. The genre continued with successes such as the *Command & Conquer* series (1995-) from Westwood, *Warcraft* series (1994-) from Blizzard, and *Age of Empires* (1997-) by Ensemble Studios.

RTS games were more complex than other real-time games and did not force players to wait for other players to complete their turns as in other strategy games. The genre forces players to not only divide their attention between all the units they command but also forces players to divide their attention between giving the units commands and planning providing an interesting (and sometimes frustrating) interplay of somatic and temporal displacements.

First-Person Shooters

Although preceded by games such as *Ultima Underworld* (1992) and *Wolfenstein 3D* (1992) that had first-person views, *Doom* (1993) from Id Software established the first-person shooter (FPS) as a genre (Kent 2001). In these games the player experienced a dark and hostile world filled with monster through a first-person perspective. Providing players with a new level of spatial immersion combined with tension and violence proven to be extremely popular and soon other FPS games such as *Duke Nukem 3D* (1996), *Quake* (1996), and *Unreal* (1998). Later FPSs such as *Thief* (1998) and *Deux Ex* (2000) showed how the genre could be used for games that were closer to adventure or roleplaying games than simple shooters.

As gameplay is concerned, they provided players with spatial immersion to a level where players could get lost, and made moving an avatar in a virtual game world a skill that had to be learned to an instinctive level in order to master the game. The first-person shooters allow for immersive somatic displacement where the player can really feel that his or her body is moving inside the virtual game world.

WHAT ABOUT FUN?

The fun aspect of play, the second criterion in Burghardt's list of five, is generally accepted as one of the main motivations of playing games. Unfortunately "fun" is an ill-defined and elusive concept. Usually fun is associated with freedom from stress, leisure, and positive experiences but games cause anxiety, worry, and even stress and the enjoyment mainly comes from the dynamics of suspense and relief. Thus fun might not be the right concept for describing the experience of playing games. The popular concept of flow might be a better alternative. Flow experience is

> so gratifying that people are willing to do it for its own sake, with little concern for what they will get out of it, even when it is difficult or dangerous (Csikszentmihalyi, 1990).

Flow experiences consist of eight elements:

1) a task that can be completed;
2) the ability to concentrate on the task;
3) that concentration is possible because the task has clear goals;
4) that concentration is possible because the task provides immediate feedback;
5) the ability to exercise a sense of control over actions;
6) a deep but effortless involvement that removes awareness of the frustrations of everyday life;
7) concern for self disappears, but sense of self emerges stronger afterwards; and
8) the sense of the duration of time is altered.

The first five elements are structurally more interesting for the sake of discussion than the last three which are, more or less, the result of the first five elements. Games as caricatures of intentional activities fit well to the first five elements: 1) they almost always have an end condition; 2) starting to play the game requires that the players concentrate on playing the game and the games, at least the current computer and video games, provide various stimuli the keep the players interested in the game; 3) games have clear and discrete goals which can be described as caricatures of possible real tasks; 4) the feedback is given in simplified and often symbolic way, for example, by keeping score; and 5) the range of potential actions is limited and discrete and usually easily available for the players. Anyway, we can call the experiences the games provide as fun, flow, engrossment or involvement but the psychological basis for the experiences stays the same. As suggested in this chapter, looking at games as caricatures of intentional activities with the associated somatic and temporal displacements and predictive and dramatic closures might give us better conceptual tools for dissecting the elusive fun of playing games. The more intricate details of how these concepts are related to the fun still remain inadequately explored but they seem to provide a starting point for a more thorough elaboration and empirical verification of the cognitive and neuroscientific foundations of fun in games.

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Ulf Wilhelmsson

Game Ego Presence in Video and Computer Games

The central point of departure for this chapter is that computer and video games can be defined as a *technologizing of the human desire for playing, competing, learning and being social* through Game Ego presence. In that respect they are influenced by and in turn also constitute an influence upon human culture on several levels which this chapter will briefly discuss before elaborating more specifically on the Game Ego presence and narrative aspects of computer/video games with a basis within experientialist cognitive theory. This specific field of cognitive theory is primarily based on the work of George Lakoff and Mark Johnson respectively and in collaboration (Johnson, 1990; Lakoff, & Johnson 1980, 1999; Lakoff, 1987a, 1987b, 1993, 1996). Their central argument is that the human conceptual system is tightly connected to the configuration of the human body which is highly relevant and interesting when discussing presence within video and computer game environments and the manifestation of a Game Ego presence (Wilhelmsson, 2001a, 2001b, 2006a).

In order to set the scene for the following discussion let us first consider the cultural impact and importance of games and play in general. The elements of games and play in general are of importance for cultural development and the relation between games and play and other cultural phenomenon constitute an interesting field for academic studies (Caillois, 1961; Huizinga, 1949; Murray, 2006). Human beings make use of different technologies and instruments of play and games such as card decks, footballs, board games, yo-yo etc. Games are also important to science, be it philosophy (Wittgenstein, 1953), economics (Nash, 1950) anthropology and sociology (Caillois 1961), cognitive theory (Gander, 2005), and computer science (Turing, 1950) as well as humanities with the study of games from a narratological (among others Murray, 1997, 2006; Ryan, 2001, Wilhelmsson, 2001a, 2001b, 2006a and ludological (among others Aarseth, 1997, 2001, 2004; Eskelinen, 2001; Frasca ,1999, 2003; Juul, 1998, 2001, 2003, 2005) point of view and as work of art with esthetical dimensions in its form and content respectively.

Games of different kinds are generally well known to large parts of an ordinary population in a given culture (Caillois, 1961). Therefore it is not especially surprising that during the history of Western Europe, games and play have been used in philosophical and other scientific contexts to pin

point certain aspects of being human. Blaise Pascal for instance, is not only famous for his work in the fields of philosophy, theology, science and mathematics[1] but also for what is known as Pascal's wager (Pascal, 1660). The wager is a good example of using a game situation to point out that the best way to live ones life is to make the bet that God exists since that way of living will be, in the case of God's actual existence, the most beneficiary to the individual and if He does not exist the individual does not actually have a lot to loose living his or her life as if He did exist anyway. The wager points out that you must weigh possible gain against possible loss and you will gain more if you live as if God exists. Games consist of quantifiable and calculable states in relation to strategic thinking. The basic question to ask in any wager situation is: How much can I afford to lose and how much will I gain if I win in relation to the risk taken? Pascal addresses the human need for good reasons to act in a specific way and the human desire to play by postulating the issue this way i.e. as a kind of gamble with the immortal soul at stake.

Closer to our own time writers and scholars such as Huizinga (1949), Nash (1950), Wittgenstein (1953), and Caillois (1961) all have tried, for different reasons, to come to terms with games and play and the importance of these to human culture (Huizinga and Caillois respectively) and/or use the concepts of game and play as the framework for explaining complex problems (Wittgenstein and Nash respectively). Huizinga's (1949) interesting study of games provided an early manifestation that games and play are important to human culture. Huizinga applies concepts like "the magic circle" (e.g. Huizinga 1949, p.10, 11, 20) that might at first seem a bit nonscientific by today's standard in academic writing (though this term has survived in the work of for instance Salen and Zimmerman [2003])[2] to designate the specific mode and space of play a player need to enter to separate him or her self from everyday life. Nash used game as the underlying concept of economics to identify crucial factors in economic systems and to understand how economies develop (Nash, 1950). Wittgenstein used games as a prime example of explaining the complexity of categories and as a framework to explain the basis for human languages describing language as acts of play. In addition he came to the conclusion that games can only be classified by family resemblance and that the phenomenon of games and the acts of play is impossible to fully define in one single definition that will hold for all games in all times. According to Wittgenstein there are simply too many forms of games and play why *a single* categorization of the phenomenon as such is not possible. This does not mean that games are impossible to categorize but that games are diverse and may have many different qualities and that all games does not share all qualities assigned to games as a whole.

Roger Caillois' sociological theory centered on games and play showed that the social and sociological aspects of games are important factors that need to be addressed. Huizinga's (1949) study and Caillois' (1961) taxonomy of games have been discussed, criticized, revised and abandoned in attempts to

understand computer and video games by among several others Juul (2003) and Eskelinen (2001). Despite the critique raised against Caillois' taxonomy the two basic nodes of ludus and paidia (i.e. rules versus improvisation) and his four basic categories of games Agôn, Alea, Mimicry and Illinx provide an initial taxonomy of games that can serve as a starting point for studies within the field. These two nodes, ludus and paidia will in the present chapter be related to narration and narratives as well as to games.

To conclude from the above; games and play as such have been used to explain aspects of culture as well as they have been providing examples in a more philosophical and scientific context due to the fact that people actually does play and involve themselves in games and that games seem to transcend many cultural differences. In my earlier work I have used a more or less standard version of computer game history in order to extract a number of frameworks and specific qualities that designate computer games (Wilhelmsson 2006b). The succession and selection of these frameworks are based on a standard version of the history of computer games found in the work of for instance Kent (2001) and on several websites (such as for instance Bellis, n.d.; Herman, Horwitz, Kent & Miller, n.d.; History of Video Games Retrieved Feb 23, 2007) and is not to be understood as a complete set of frameworks. My purpose has not been to question or raise critique on this particular historical canon (which of course could be interesting and necessary for other kinds of discussions) but rather to extract basic qualities of games that are hidden within it. Computer and video games as a phenomenon has undergone quite some transitions during the decades of their existence. From being test bed simulation of human thinking and behavior, to simulate other games under specific circumstances, to commercial success and getting out of the institutions into public space and then into private space, computer and video games have constituted themselves as multi billion entertainment industry gradually replacing film and television as the major medium. Games may be used to explain how historical events might have been experienced by the people living there and then. Computer and video games are instruments for artificial intelligence, simulation, entertainment and also show pedagogical values. For the present chapter the following elaboration on these frameworks are of interest and will serve as the backdrop for the following discussion.

1) Thinking machines: games incorporate quantifiable and calculable states: strategic thinking: problem solving: resource handling and interactabillity.
2) Simulation machines: simulation of physics: social dimension based on competing (Agôn in Caillois taxonomy): learning through interaction with objects: instrument for evaluation of performance: pushes the technology to its limits and beyond. Here we find games such as *Tennis for Two* (Higinbotham, 1958), and *Spacewar!* (Russel, 1961).
3) Design experiments and user interface problems: *enclosed* design of cabinets or consoles, handhelds, controls, screens affects the playability and/or the game play: aesthetic values in their own right: cutting edge design such as the cabinet design of *Computer Space* (Bushnell & Dabney, 1971).

4) Commercial machines for public environments: the complexity of *Computer Space* (Bushnell & Dabney, 1971) versus the simplicity of *PONG* (Alcorn, A. and Bushnell, N. 1972): visually simple games constitute a social interaction process if game play is strong: communication of the rules and the key elements in the game play.
6) Social interaction machines: the institutionalization of games abandoned: owning games versus playing games: entering social relations.
7) Pedagogical instruments: simulation of principles: simulation of events: playfulness: engagement: evaluation: competing in relation to learning goals in abstract and concrete modes respectively. Here we find commercial games such as *Call of Duty 2*. (Infinity Ward, 2005)
8) Storytelling machines: the internal logic based structure of and the programmability of computers allow them to be the medium that carries interactable stories. Here we find games such as *Zork I: The Great Underworld Empire* (Infocom, 1981).

The next section of this chapter will elaborate on the concept of a Game Ego (Wilhelmsson, 2001a, 2001b, 2006a, 2006b, 2006c).

GAME EGO PRESENCE AND NARRATIVE EXPERIENCES FROM VIDEO AND COMPUTER GAMES

When playing a video or computer game the player needs to be manifest, i.e. have a presence, within the game environment by a Game Ego function in order to perform actions and enact a point of being (Wilhelmsson, 2001a, 2001b, 2006a, 2006b, 2006c). The following section will discuss the Game Ego presence in relation to narrative and interactable qualities of computer and video games.

The Game Ego is a bodily based function that enacts a point of being within the game environment through a tactile motor/kinesthetic link. Computer and video games typically allow the game player to establish a virtual proprioceptive chain based on sight, hearing and tactile motor action adding up to a tactile motor link and kinesthesia, i.e. a sensory awareness of the position of the body within the game environment. In turn this may result in a strong performative experience of interaction, interactabillity and being. The player does not only see and hear but is enacting a point of being. Computer and video games make possible multi sensory experiences and allow rule governed player interaction with the objects and environments within the game through the agency of the Game Ego function. The player incorporates a Game Ego function, which serve as an instrument for controlling the game environment. The exertion of control is an extension of the player's sensory motor system via a tactile motor/kinesthetic link. The end outcome of this control is not only the controlled and perceived motion on a screen but also, and more important, the experience of locomotion within an environment. It is a part of the player that is acting within the game environment. It is a motor part and an extension of his or her sensory motor system. To quote Lakoff and Johnson:

> *An embodied concept is a neural structure that is actually part of, or makes use of, the sensorimotor system of our brains. Much of conceptual inference is, therefore, sensorimotor inference.*
>
> If concepts are, as we believe, embodied in this strong sense, the philosophical consequences are enormous. The locus of reason (conceptual inference) would be the same as the locus of perception and motor control, which are bodily functions. (Lakoff & Johnson, 1999, 20. Their italics).

The human conceptual system shows a relationship to the motor system of the human body and is tightly connected to the emotional system so that no clear-cut boundary can be drawn between them. The locus of reason is also the locus of perception and motor control (Lakoff & Johnson 1999; Wilhelmsson, 2001b, 2006a, 2006b). The Game Ego primarily interacts with objects at a basic level which is characterized by the following conditions (Lakoff & Johnson 1999):

Condition 1: The basic level is the highest level at which a single mental image can represent the entire category. Lakoff and Johnson's example is that humans are able to form one mental image of a chair but not of furniture (which is more general). In the context of computer/video games a paddle in a game such as *PONG* stands for all kinds of instruments that allow hitting/hinder a ball and provide a single mental image for such objects within the context of the game.

Condition 2: The basic level is the highest level at which category members have similarly perceived overall shapes. Furniture comes in a number of shapes. A chair has a basic outline that makes it a chair rather than something else.

Condition 3: The basic level is the highest level at which a person uses similar motor actions for interacting with category members. This is of course important for the interactive experience of video games.

Condition 4: It is the highest level at which most of our knowledge is organized.

All together this means that a video/computer game environment need to fit this basic level since this will make it easier for the player to form an initial understanding of the game as a rule based system consisting of quantifiable and calculable states, how the player need to use strategic thinking to solve problems problem and make the resource handling transparent. The interaction structure need to communicate the central aspects of the game play elements i.e. the user inter face design and the overall design of the game really make a difference (Wilhelmsson 2006b).

THE SUBJECT AND THE SELF

According to Lakoff and Johnson (1999), there is one single, general metaphor schema that all subject-self metaphors relate to and are special cases of. There is a basic structure within the Subject-Self system of metaphor grounded in four types of everyday experiences: 1) manipulating objects, 2) being

located in space, 3) entering into social relations, and 4) empathic projection-conceptually projecting ones self onto someone else e.g. as when a child imitates a parent (*ibid.*). This gives that the Subject-Self metaphorical system in its general outline serves as a description of what video/computer game playing is basically about. Playing video games is about manipulating objects in space while entering semi or real social relations and a process that allows motor based identification with and emotional empathy for the avatar. All these experiences are also found in the discussion of the frameworks above. The manipulation of objects is central for games usually found in standard versions of the history of computer games such as chess, *Go*, as well as *Tennis for Two*, *Spacewar!*, *PONG*, *Pac-Man* (1980) etc. Being located in space, i.e. to have presence through action is a protruding quality in all of the frameworks especially in simulations. Empathic projection is eminent in games such as *Pac-Man* and *Call of Duty 2*.

The Game Ego function as such might be a visible character that the game player can control on the screen, an avatar within the game, but this is not necessary. Consider *Tetris* (Pazhitnov, 1985) in which only the actions performed by the player are visible. The objective of the game is to hinder building blocks to reach the top of the screen. The game as such incorporates quantifiable and calculable states (when a specific amount of block reaches a specific level the game is over): strategic thinking and problem solving (since the next block available is shown it is possible to make a plan where to place it): interactabillity (the blocks are manipulable and will turn immediately given the proper command). There are no hands shown turning the different pieces. However, there is still a Game Ego function within this environment that allows control into the audiovisual field of the game player. That very function is a manifestation of the player's presence within the game and provides a tactile/motor kinesthetic link between the player and the game environment. The Game Ego is that function, the agency within the game that manifests the player's presences allowing him or her to perform actions. The visual form it takes is not as important as its functional schemas. In some games, such as text based games e.g. *Zork I: The Great Underworld Empire* (henceforth called *Zork*,) the Game Ego is only manifest though words and the process of typing and the player will need to imagine him or her self within the environment as the agent performing the actions. Such games contain written text that has a level of interwriteabillity i.e. the game player is part of the *writing* of the adventure since he or she has to write text commands to explore the game environment and unfold the story. *Zork* is an interesting example. It is construed around an environment that permits or constrains locomotion and the manipulation of objects within the environment. The game is sometimes referred to as a "second person" game (*AFGNCAAP*, n.d.). The game system addresses the player as "you". Genre wise and within the computer game business this classification is motivated. However, it is not a *second person* performing the actions within the game. When a player relate to the game and the game environment s/he refer to her/his Self and her/his

Subject. This means that there is a Game Ego presence in the game. The referent of "you" is the performing agent "I" when a player execute a command.[3] *What I read is what I see and what I type is what I do*. To be more accurate, what I read is what I observe with all my senses and what I type is how I am reactive and proactive. The text based approach to computer games brought with it a text based quality of storytelling and turned computer games into storytelling applications that allowed, if not new, a way of telling a story that allowed audience participation to at least some degree by allowing the player to be reactive and proactive in a weave of text interactions.

A Game Ego might also be manifest as a yellow circular shape chewing dots and ghosts as in *Pac-Man* or look like a tiny and cute dragon as in *Spyro the Dragon* (Insomniac Games, 1998). The Game Ego function serves as an anchoring force within the system of the game and provides a key element in the process of engaging the player and providing a sense of being within the fictional space time of the game through the possibility of exerting force upon the environment. Being is not only to observe but also and more importantly *to act within the environment through Game Ego presence.*

In recent years there have been quite a few studies on the ludological versus the narratological aspects of games (Eskelinen, 2001;Frasca, 1999, 2003; Juul, 1998, 2001, 2003 [to less extent], and 2005; Salen & Zimmerman 2003; Wilhelmsson, 2001a, 2001b, 2006a and 2006b… the list could expand indefinitely and depending on the canon you specifically advocate it could contain numerous other scholars and titles than those listed here and now). Several scholars and professional game designers have argued that narration will inflict upon the game play and is incompatible with interaction (Adams & Rollings, 2003; Juul, 1998 and 2001). The argument put forth by Adams and Rollings and also by Juul, is that the more elements of narration the weaker the game play will be. To quote Juul (2001):

> In an "interactive story" game where the user watches video clips and occasionally makes choices, story time, narrative time, and reading/viewing time will move apart, but when the user can act, they must necessarily implode: it is impossible to influence something that has already happened. This means that *you cannot have interactivity and narration at the same time*. And this means in practice that games almost never perform basic narrative operations like flashback and flash forward.

Narration in video and computer games is, according to Juul in this specific context, something that is told *by* someone *to* someone else and often so by a cut scene (video clips) that disconnects the player from the game play (i.e. the story time, narrative time and reading/viewing time move apart) rather than to let the player just *play* (i.e. all events share the same time). That is: to be told a story is to be passive and inactivated (no motor interaction or activity) and shut out of the loop of game play events.[4] The player is not a player but a passive audience with no influence on the staged events.

Narratives are not necessarily something that has only to do with language as verbal activity in oral or written form even if narratives can be and often are manifest as and through such activity. Narratives are often representations and manifestations of audio-visuo-emotional-cognitive-motor schemata, whose central form is the experiential action sequence. To avoid misinterpretation, I am not saying that the debate between ludologists and narratologists has suggested that all games either are or are not narrative (or that all narratives are games) in essence. I do share the view held by among others Juul in his later writings (2005: the introduction) that a great deal of games and narratives do share some basic qualities but also do have specific traits that are not easily transferable between traditional storytelling media and computer games. Furthermore, I do also advocate that by combining ludology and naratology we will gain substantial knowledge about games and narratives respectively and in relation to each other as well as knowledge about the ludus in narrative and the narrative in ludus.

According to the dramaturge Mats Ödeen (1988), narratives have a cosmonogic function. That is to say: narratives are in some ways a part of building and reflecting the worldview of a specific culture and society and hence also may have a dogmatic level as a pedagogical instrument. Narratives, or the belief in and understanding/interpretation of some canonical narratives, are the common denominator for a specific culture and the glue that hold the culture's internal structure intact. Narration understood as a cosmonogic activity is for instance found in most religious systems. E.g. the creation process is described in the *form* of a narrative even if the *style* of the narrative is construed in a way that makes it appear as something else. Consider Genesis 1:1 "In the beginning God created the heaven and the earth". Some narratives, just like this one, have been held and still are hold to be true by a large amount of people. As this example is meant to show, narratives have an enormous potential to explain something about the world surrounding the human being and serve to explain how the world is constituted. Narrative carries dogmatic structures.

Narrative as such can be defined as a formal system that is based on the logical and causal succession of events which of course is a low end basic textbook definition found in the work of for instance Edward Branigan (1992), Bordwell & Thompson (1993). Narrative is the product of storytelling or the process of storytelling as such. In a narrative, there is/are some kind of location or locations and there is something going on. That is, there are objects, beings and processes within a narrative that are literary *taking place* and there are some kinds of actions performed by some kinds of agents. I.e. in a narrative we find processes carried out by existents. There are also patterns that give structure to the relation between processes and the existents. Within a computer or video game, the structure may be based on the sequential player participation and choices that in turn are based on interactivity and interactabillity. Moreover, games do operate on a logical basis set by the rules of the game much like more traditional narratives (folktales, movies, novels, operas, music pieces etc.) do. Narratives are often categorized in genres where the

genre provides the set of rules and hence the internal logic of the succession of the events (Bordwell & Thompson, 1993). Genre is also possible to understand from a syntactic as well as a semantic approach (Altman, 1984). Computer and video games generally have a fixed and absolute system of game mechanical rules i.e. the quantifiable and calculable states, the resource handling and interactabillity within the game is preprogrammed. The level of ludus (Caillois, 1961) is extremely high. This differ from more traditional forms of narratives where these qualities are not mandatory even though genre or other semantic and/or syntactic rules (Altman, 1984) have been strictly applied from time to time e.g. during the 17th century France. (Sjöberg, 1999). Vladimir Propp's extensive work on the morphology of the Russian folktale shows that the sequences of events within a large number of folktales are invariant which is to say that the logic within the story line is always the same (Propp, 1968).

Even if the formal structure may be invariant a storytelling situation has a dimension where the audience is filling in the gaps and use their imagination to visualize and audiolize the characters, the environments and the things that happen in the story. In some narratives such as short stories by William Gibson (1981/86) there are voids of left out hinted at information that the reader must interpret. The word audience designate that stories are told to us and that we hear the story which implies that the process of storytelling has its roots within oral culture (Iser, 1974; Ong, 1982/1990). In such a culture the basis of stories being told is to let the characters perform actions and be heroic and hyperbolic rather than realistically portrayed humans. If the audience is to remember the characters, the characters need to be larger than life and perform in an extraordinary way. The environments in such oral culture stories are seldom well defined since their main function is to provide the background for what happens. Only if it is necessary for the character in the story, or for the audience, to know something about the environment this is being told and often so with only a few words. Redundant information is kept at a minimum. (Ödeen, 1988; Ong 1982/1990). A narrator might also make use of improvisation (paidia) to play at the audience' reactions when narrator and audience are present within the same environment at the same time in a reactive/proactive relation. If a specific event or turn in the narrative is appreciated it is likely that the narrator enforces that kind of events and begin to improvise and elaborate the story with this in mind. In a writing culture (or cinematic or game culture for that matter) the level of narration need to be preplanned to a higher degree since the level of ludus is more protruding. The reactions to specific events are harder but not impossible to foresee: a trained film director knows quite well what the reaction to specific events will be as does a skilled author or game designer). The audience is an instrument of play.

A story that is told involves not only the primary sense but allows other sense modalities to be part of the cognitive processes of making meaning from what is told through mental projection. A central idea in the experientialist approach to cognition is the connection between the human conceptual

system and the human body's motor capabilities and the emphasis on schema metaphors such as ACTION-LOCATION, SOURCE-PATH-DESTINATION (Lakoff & Johnson, 1999, Wilhelmsson 2001b).When being told a story the audience make use of the body/mind configuration to understand and conceptualize what is narrated. The body/mind system includes the sensory motor system why this is not discernable from the locus of reason. (Lakoff & Johnsson, 1999; Wilhelmsson, 2001b, 2006a, 2006b).

One common denominator for games on the one hand and narratives on the other is the causal sequential action based on some kind of conflict. In the case of traditional narratives a hero or other character performs the sequential actions and in the context of games the player must handle and enact a chain of events during the game playing process. I am not suggesting that all games have a strong narrative as a central reason for their existence but I do suggest that there is a dimension of narration in many games and that games often are structured around a conflict of interests. My gain will be your loss so to speak. It has been argued that games are fundamentally different from stories since games often consist of repetitive sequences in which the visual Game Ego manifestation (an Avatar) dies and the player must try and try again to overcome certain passages in the game to reach the end state and win the game (Adams & Rollings, 2003). Repetition is motivated by the game play structure and the game mechanical rules. Repetition is found in many traditional narrative forms as well but it is expressed in different ways and for slightly different purposes. Old folktales do often incorporate a number of repetitions of certain actions and obstacles to overcome before the hero of the story succeeds with his or which is rarer, her mission. The hero must pass three of this and three of that and get to the innermost cave etc. which is also the case in many computer games. This hero's journey is put in to the story in order for him or her *to learn* more about the opponent and to master the surrounding world so that he or she may be victorious in the end. The same structure is found in many computer games in which the player must hack and slash his or her way through and die several times in order *to learn* how to win the specific action sequence and reach the winning condition at the end of the game session. The player practice skills and gain information through the actions performed and can win the game through practicing specific actions over and over again. In folktales the structure may be considered a left over from a prior oral tradition. It is easier to remember the events if they are repeated and some folktales have also originally been meant to be sung rather than spoken why rhythmic patterns have a role in this structure. It is also a technique used for building narrative tension (even if it can be very boring and counter productive). In other words: it is a similar structure i.e. repetitive sequence. From the position of the hero in a folktale it is a sequential learning process and for the player of a game a sequence of practice and learning specific skills such as certain moves and combinations as well as the gathering of knowledge about the game environment and other characters within the game. To act is to gain knowledge about the surrounding world. From the position of the narrator this structure may be used as building dramatic tension and from the position

of a game designer it may be used to allow the player to practice before taking on enemies and distribute information about the game world stepwise. It is also a technique used to let the player feel progression in specific skills needed to achieve the end state of the game.

As we may conclude so far, narration includes a level of intellectual and motor interaction. However, narration and narratives are typically conceptualized as linear and sequential activities and phenomenon in a writing culture (Ong, 1982/1990). Writing words is to use tools and instruments and is the result of technology. Computer games as specific phenomenon are embedded in and partially the result of a writing culture. Books are typically made up by a linearly structured text. But even a book allows some interactions from the reader (such as turning pages, start to read wherever in the text, rip out pages, make notations in the margins, burn the book etc.). In addition, books for very young children may incorporate more interactability such as pulling and pushing objects, incorporate surfaces of different textures to stroke etc. in order to provide a set of experiences to investigate while also and at the same time taking part in a story. Human beings are able to perform more than one mental process at one time why we actually can interact *and* interpret a narrative at the same time. The relation between events in short term memory constitutes the essence of *now* in interaction *and* narrative sequences. In the discussion above I quoted Juul (2001) and his ideas on narration being in conflict with interaction. His argument is based on the assumption that there are different aspects of time in interaction versus narration sequences. But narration can also be understood as setting the scene and providing the basic conflict for a player to act upon which will enable the player to be the proactive part of the narrative/game experience. NOW is related to PAST and FUTURE in a triadic relation schema as follows: The NOW is always either the passed time (PAST) or the time to be (FUTURE). The concept NOW is primarily designating the duration of the time span that is kept within short term memory. The essence of NOW is that it is a moving point. NOW and NOWNESS are duration and movement along a line or on a surface. It is not spatial existence as such but related to space. Within a game the Game Ego is the function that allows the player to move within the now and perform actions and experience the narrative elements i.e. the Game Ego provides presence within the game environment. The use of present time in a text based adventure such as *Zork* situates the player in the environment at the present time. Consider the opening lines of the game: "You are standing in an open field west of a white house with a boarded front door. There is a small mail box here." (*Zork*). The use of present time signals presence within the environment and within the story evolving. In this respect, time is handled in the same way in *Zork* as in *Pac-Man* and *Call of Duty 2*. The player is present within the game environment through the Game Ego. The time is now.

POSTLUDIUM

Play and games in general are probably more essential to humans than even current research can fully understand. Computer and video games in particular are ways of technologizing the human desire for playing, competing, learning and being social alongside other forms of technologies of play and games such as card decks, footballs, board games, yo-yos etc. Computer and video games have the ability to generate a vast amount of experiences. Computer and video games relies on the integration of the human mind and the human body which should be understood not as separate entities but as one body/mind system. Games are important to humans in several ways and for several reasons. We learn from games, we sometimes earn money from games and we have yearn for games. Games are capable of being storytelling devices as well as they may generate strong sensory immersion and a feeling of being within an environment through tactile motor interactability through a Game Ego within the game. Games are also fun, progressive and sometimes even provocative (as are papers on computer and video games). To conclude this chapter let us play an interactable story game of the simplest kind and have some fun.

Once upon a time there was;
a) a succession of events
b) darkness and a void
c) a Hero
that/who
a) lead to the end state
b) nobody really knew much about
c) everybody loved
and one day
a) the CEO of IBM alt. Apple alt. Atari
b) the Big Bad
c) the King and Queen
called
a) President Kennedy up!
c) to play a game of chess!
d) Game Over!

NOTES

1. These aspects of Pascal's work has in itself had its inflictions on games and gaming through his efforts on a theory of probability which is at the core of calculating the odds in games like poker and playing with dices.

2. NB: I do not suggest that Kalen and Zimmerman's work is nonscientific as such.

3. In my earlier work (Wilhelmsson 2001b) I argued that a strong direct control was necessary for establishing a Game Ego presence. The work of Gander (2005) has proved me wrong on this but has also provided empirical evidence that supports the claim made about the Subject/Self.

4. Juul as well as Adams and Rollings have in later work suggested that there might be more room for narrative within a game context than suggested by the works referred to (Juul 2005 and Adams & Rollings 2007).

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Experiencing a Multi-Player Computer Game through a Meaningful Role

MEANINGFUL ROLE IN MULTIPLAYER GAMES

In our everyday society roles are numerable. A role can be considered, for example, as a part performed by an actor in a drama, a functional position in a certain organisation (e.g. a team leader), or a part taken in social context (e.g. a friend or a mother). These different positions assumed in the society come with a set of expectations (Coutu, 1951). For example, a team leader is expected to behave in certain manner and to take certain actions. Similarly communication in different social situations asks for appropriate behaviour. Thus, roles can be thought to consist of behaviours that somehow "ought to" or "should" be performed (Thomas & Biddle, 1966). Some roles also require an act of assuming another mindset which is done, for example, by actors when they prepare for a role performed on the stage (Stanislavski, 1961).

In our society everyone holds multiple roles and we shift naturally between these roles (Coutu, 1951). It is rather common to describe persons through the roles they occupy (e.g. she is a teacher and plays guitar in a rock band). In a virtual world playing a role can be seen similarly as a sum of actions the player engages in (e.g. she is a warrior dwarf and uses an axe). The player entering a virtual world steps into a virtual body and at the same time receives a set of expectations of behaviour. Therefore a person, a player, is by necessity playing a role. (Morie, 2002) This role can be communicated to the player, for example, through information about the world, presentation of gameplay goals or through the game character description itself (his motifs, assets and limitations) (Laurel, 1993).

Considering role as a set of behavioural rules that rise from expectations offers a fruitful basis for viewing roles in computer games. In a way the game assigns the expectations for the role. The game expects the player to take part in certain actions or the game will not advance. In the strictest sense, if the player refuses to take any of the offered roles, she can not succeed in the game. In other words, the player needs to accept the behavioural rules and act accordingly in order to play the game. Often, in contemporary games, these behavioural rules emphasize the mechanical nature of play. The role can easily become a mere interface for task oriented action (*achievement*) of gameplay

(Rouse, 2000). This emphasis can result in abandoning or overlooking other elements of the role, such as social and immersive aspects.

Even though mechanical behaviour can be dominating type of gameplay in computer games, social and immersive aspects of play have an important part in many player experiences. Different types of societies appear in many popular Massive Multiplayer Online Role-Playing Games (MMORPGs). Some societies such as organized clans have a hierarchy of roles that the players occupy (Jakobson & Taylor, 2003). Some other societies such as short term parties may be put together from real-life societies (e.g. group of friends) or formed through virtual characters and consist of anonymous players (Jakobson & Taylor, 2003). It is also common that some players take certain roles such as a helper that aids new players to get into the game. In all these cases the players have a rather clear role to play and set of appropriate behaviours. In-game societies can, therefore, be seen to have similar qualities with real life societies. The game roles can also be framed as social positions in a virtual world. These roles entail expectations that can enrich the gaming experience through social interaction.

Virtual worlds also often require the act of assuming another mindset. This can be clearly portrayed through role-playing games, in which the players create an imaginary reality together with all the participating players (Mäkelä *et al.*, 2005). Fine (1983) argues on role-playing: "The gamer plays the game as himself, while the player who wishes to lose himself to the fantasy is the true role-player –he plays the character." Thus, it can be considered that performing functional actions and/or participating in social interaction do not involve all the aspects of a role. Players also need to step into a role which happens only after they assume the identity of the game character and engage in attaining the goals of that character (Crawford, 2003). Most contemporary computer games do not encourage this type of role-play (i.e. emphasising the qualities of becoming someone else). Even in the genre of Multiplayer Computer Role-Playing Games, the nature of behaviour is firstly mechanical with social communication as a possibility for secondary action. Role-playing is something the players need to be willing to pursue themselves. In these cases the virtual characters will play their parts (as actors) but the role needs to be brought alive by the player.

When considering meaningfulness of play, Salen and Zimmerman (2004) argue that it occurs when the relationships between actions and outcomes in a game are both discernable (result of a game action is communicated to the player in a perceivable way) and integrated (an action a player takes has immediate and subsequent effect on the play experience). Thus, by following the line of thought, the player needs to be able to step into a role which communicates the actions and has both immediate and lasting effect on the play experience. This requires that the role is integrated to the game, has a clear part to play in it, and is intertwined with the gameplay and the society around it (Lankoski, 2004). Furthermore, it is also important that the character in the game is designed to have qualities that make it appear important to the player. The player needs to understand the game character as a second self in

order to assume the role (Friedl, 2003). The meaningful role in multiplayer games can, therefore, be seen to form in the intersection of actions (achievement), social interaction, and aspects of submerging one's self in the game and the character (immersion). Defining a meaningful role with the concepts of achievement, social interaction and immersion lead us to consider a theoretical model created by Yee (2006). The three aspects of experiencing a role form an interesting connection with the three categories of player's motivations of play presented by Yee (*ibid*.).

FRAMEWORK FOR ANALYSING ROLES IN GAMES

Yee (2006) has extensively studied what motivates the players' actions in online games. He has formed a model of motivations of play through factor analytic approach utilising survey data collected from 3000 players on several different MMORPGs (e.g. *EverQuest*, *Dark Age of Camelot*, *Ultima Online*, and *Star Wars Galaxies*). The categorization of his model is used here as a framework for approaching different aspects of role. Yee (2006) divides motivations of play into three main categories: achievement (functional role), social (role through social context) and immersion (imaginary role, character). These categories are further divided into subcategories that depict the nature of each category in more detail (Table 1). In our examination, we use the main categories to structure the discussion and point out examples that relate to the subcategories.

Achievement	Social	Immersion
Advancement Progress, Power, Accumulation, Status	**Socializing** Casual Chat, Helping Others, Making Friends	**Discovery** Exploration, Lore, Finding Hidden Things
Mechanics Numbers, Optimization, Templating, Analysis	**Relationship** Personal, Self-Disclosure, Find and Give Support	**Role-Playing** Story Line, Character History, Roles, Fantasy
Competition Challenging Others, Provocation, Domination	**Teamwork** Collaboration, Groups, Group Achievements	**Customization** Appearances, Accessories, Style, Colour Schemes
		Escapism Relax, Escape from RL, Avoid RL Problems

Table 1. Motivations of play in online games (Yee, 2006).

FORMING A ROLE THROUGH ACHIEVEMENT MOTIVATION

This category of motivations of play reflects the functional roles of real life. *Achievement* means that the player's role forms through *advancement, mechanics* and *competition*. Players, who score high on subcomponent *advancement*, derive satisfaction from reaching goals, levelling quickly, progressing and gaining power in the game (Yee, 2005). Gamers who are interested in *mechanics* enjoy analysing and understanding the system. Their goal might be to facilitate templating or optimising a character that excels in a particular domain (*ibid.*). Similarly, players who fall to the domain of *competition*, enjoy the experience of competing with other players. They like to experience power of beating or dominating other players (*ibid.*).

Consequently, *achievement* is about advancing one's skills or excelling over other players. By concentrating on these types of actions the role receives rather mechanical qualities. It is the efficiency in advancing ones character that becomes the focus point of play (Taylor, 2003). The mechanics and numerical values behind gameplay guide the player's actions. In this way the player may become rather tied to perform the role in a pre-designed manner.

FORMING A ROLE THROUGH SOCIAL MOTIVATION

This category of motivations of play reflects to roles that are taken in social context. Players who are motivated by the social aspect of the game experience it through *socializing*, *relationships* and *teamwork*. *Socializing* players enjoy meeting and getting to know other players (Yee, 2005). The game worlds offer them casual and pleasant entertainment. Another subcomponent, *relationships*, describes players who are looking to form sustained, meaningful relationships with others (*ibid.*). Players who are interested in *teamwork* enjoy working and collaborating with others. They derive more satisfaction from group achievements than from individual achievements (*ibid.*).

Virtual game worlds offer various possibilities for forming social roles. In many ways they have similarities with real life social behaviour. *Socializing* in game usually includes qualities where game content affects the interaction. Anonymity of the players offers possibilities for trying out different roles (Turkle, 1999). Accordingly the fictive content such as extraordinary races and unconventional surroundings blur the line between real and fantasy. Furthermore, the possibility of co-experiencing the game through social interaction offers players an element that supports the occurrence of meaningful experiences (Battarbee, 2003). All in all, there is much depth that can enrich the experience of playing a role when the mechanical tasks are complemented with a social frame for behaviour.

FORMING A ROLE THROUGH IMMERSIVE MOTIVATION

This category of motivations of play reflects to imaginary and performed roles. *Immersion* as a motivation for play is one that can be very important

in experiencing a role. Players who are motivated by *discovery* enjoy exploring the world and discovering locations, quests or rare artefacts (Yee, 2005). *Role-playing* presents a group of players who want to experience the story through the eyes of someone else. They enjoy role-playing their characters and integrating them into the larger ongoing story of the world (*ibid*.). Another form of experiencing the character is through *customization*. Players favouring this subcomponent want their characters to have a unique style and appearance (*ibid.*). And finally, *escapism* describes players who use the game environment as a place to getaway, relax and hide from the stress of the real world (*ibid.*).

The overall atmosphere and personal relationship to one's character can be strongly formed on this area. Elements such as *discovery* and *customization* offer players tools that let them create their own content in the game world. In this way the character is made personal which helps the forming of a second self and the emergence of a meaningful role (Friedl, 2003). The personal role together with social interaction will also aid the emergence of role-playing (compare Björk and Holopainen, 2004). Through social interaction the players can transform social relationships within gameplay (Salen & Zimmerman, 2004). *Role-play* and *escapism* aspects of motivation enable the players' to experience the game on even more profoundly. Immersing into the personality of the character and interacting through that personality becomes a means to change and deepen the nature of experiencing computer games. This form of role-play is, nonetheless, completely dependent on social interaction and participation of the players (Lankoski, 2004).

DESIGN AND EVALUATION OF THE TEST ENVIRONMENTS

Yee's model is based on analysis of MMORPGs. In this study the elements of the model are viewed in the perspective of an action game and a role-playing game. *AirBuccaneers* (2004) is an innovative team-oriented multiplayer game with compelling combination of graceful air ballet, fierce pirate-like action and 3-dimensional tactical manoeuvring. *Achievement* and *social motivations* of play are central in the design of roles. The emphasis of gameplay is built mostly around *advancement*, *mechanics*, *competition* and *teamwork*. *Castle of Oulu 1651* (2006) is a non-violent role-playing game set in a virtual environment that resembles an authentic historical setting. This game is an experimental step towards combining social elements from table-top role-playing and live action role-playing to computer based game. The emphasis of role design in *Castle of Oulu* is on *social* and *immersive* motivations of play. The design of gameplay focuses mostly on *socializing*, *relationships*, *role-playing* and *escapism*. Even though central design approaches can be pinpointed, both of the games have elements of all three motivations of play. In both games the players have clear goals; they are playing the game together and the roles are designed to be meaningful. Both case experiments, *AirBuccaneers* and *Castle of Oulu*, were trialled with a set of test subjects. The data was collected through observations, questionnaires, interviews and forum discussion threads.

MOTIVATIONS OF PLAY IN THE DESIGN OF THE TEST ENVIRONMENTS

The team based and action-oriented design of *AirBuccaneers* does not offer *social* or *immersive* roles for the players directly. However, the strong emphasis on forms of team interaction and enforcement of collaboration between the players resulted in emergence of clear roles. The players have three elements to use for assuming a role they choose. The elements are (1) roles on the balloon deck (*achievement*); (2) social role through co-operation between the players (*social*); and (3) background stories, mythology and description of the virtual world and game characters (*immersive*).

In *Castle of Oulu* the main source of information regarding the different aspects of the role is the game character description, i.e. the role card. The separation of motivational elements is not as clear in *Castle of Oulu*. However, the information offered to players can be seen in the light of Yee's model. The players can assume roles through (1) primary goal and mundane tasks described in the role card (*achievement*); (2) position in the society and knowledge about threats and other players (*social*); and (3) character description, background stories of the historical setting and appearance of the game character (*immersive*).

ACHIEVEMENT AS MOTIVATION OF PLAY

AirBuccaneers focuses on strategic and tactical battles with hot air balloons, cannons and various other pseudo ancient gadgets. What happens on the balloon deck is very important and central in the success of actions. The roles on the deck are strictly tied to gameplay and form a strong basis for *achievement* aspect of play. The success of each player and team is measured in numerical values. Thus, player's who enjoy *advancement*, *mechanics* and *competition* are offered several ways to perfect and measure their skill levels. The players can choose a role of a pilot, an aimer, a fireman or a loader amongst others and thrive to be the best in one or all of the roles. Each player is equally equipped through the game character to take whichever role on the deck and change it any time they want to. Moreover, one person can manage more than one role simultaneously if necessary or desired. Players who are motivated through *achievement* are likely to be very skilled in this sense.

Castle of Oulu is built around different kind of action. All mechanical actions are designed to be reactions to social interaction. This makes pure *achievement* goals very difficult to reach. There is no numerical value to levelling, wealth, fighting skills or basically anything that can be attained with skilful solo playing. Everything depends on others and their willingness to co-operate. However, mechanical tasks are designed to the game, but only to support social interaction. For example, character's goal can be to free other players from prison (a mechanical task). The player succeeds in this task by finding out if the prisoner is guilty or not. This can only be done through social interaction with other players, asking questions (a social task) and deciding what the truth is. The player will score points if she has reached the right conclusion about the prisoner's guilt.

SOCIAL MOTIVATION OF PLAY

The tasks in *AirBuccaneers* can be seen as rather mechanical and supportive of *achievement* aspects. However, the roles that form through tasks are also designed to entail social qualities. Strong design emphasis on team play is intended to support *social* motivation of play. Especially the aspect of *teamwork* is supported by the design of gameplay. The players are encouraged to form teams and choose specific roles to be able to reach the maximum efficiency of the gameplay. One of the most important parts of successful team effort is to effectively decide how to divide the role positions and communicate the role changes. In addition to *teamwork*, the players can *socialize* and form *relationships* through chats and voice-over systems. These two subcomponents, however, are not very well supported because the gameplay consists of fast fights and purposeful actions. There is not much time for mundane chit-chat in the gameplay.

In the design of *Castle of Oulu* social motivation is very central. All of the players' actions are based on social interaction. The actions are designed to take place through the individual roles of the game characters. The character descriptions, i.e. role cards offer the frames for social and other types of behaviour in the game. Here is an example of one possible role-card from *Castle of Oulu:*

1) Position in the society and a "day job": "Your smuggled cargo awaits you on the western bank, outside the castle area. You need to get it inside the castle walls and sell it. You should do this as inconspicuously as possible - consider to whom you sell and avoid the law."
2) Primary objective: "You have decided to do your best in order to get Kutha elected. Your duty is to hand out Kutha's signs to as many individuals as possible: The more Kutha's signs are carried visibly the more definitely the voters trust that it is time to elect Kutha."
3) Threat: "You got a hold of two pretty strange looking bucks – you were almost charged with a crime for trying to use them in trade. Now you have to be careful and keep watch on what kind of money you are offered! You do not want to get more fake money."
4) Special knowledge: "You are aware of the fact that the citizens of Oulu like the mayor Antinpoika a lot – it would, however, be better, if he were a genuine scribe." (Castle of Oulu, 2005)

The implementation of social elements is, nonetheless, quite unique. There is lots of room for casual *socializing* and forming personal *relationships*. However, all players have social statuses, relationships and possible collaborators readily defined through the game character roles. This means, that the players who want to freely socialize will not progress in the gameplay. In other words, social interaction is meaningful and elemental. This forms an interesting conflict with Yee's description of the socially motivated players. In *Castle of Oulu* they are required to use the social skills to advance in the game. Furthermore, they are expected to accept the readymade relationships in addition to creating their own relationships.

IMMERSION AS MOTIVATION OF PLAY

In both games, the background stories, mythologies and descriptions of the virtual world are intended to lead the players to understand the premise of the game. These elements present material for *immersive* play and support the assuming of the role. This was not, however, supported by the gameplay. In *Air Buccaneers* the basic idea of the game is to have two teams of players. *Peasants* and *Buccaneers* fight to gain control over the skies in their hot air balloons. The description of *Peasants* and *Buccaneers* as well as the world and the characters deepen the personal connection and create the mood for the game world and the character the player chooses to play. The following quotes from the game demonstrate the form of written material that the players are able to use in assuming their roles.

> [1] "And from their fortressed camps in the cold forests loom the Buccaneers, raiding the villages to eek out their Brutal livelihood. As they clash, their legends take form, their stories entangle, and the glory arises from their scattered remains." (Description of the team, AirBuccaneers, 2005)
>
> [2] "An earthy figure mingling with the trodden soil, she strides between the smoke trails and small, still smouldering fires; it is early morning, she has some ways yet, tasks. With long strides, she passes the fields, the earth takes over the little signs of toil spreading from the village; it divulges more secrets, it touches you, yet it does not embrace. Through the mingled branches dark, comes the sight of light playing across open water. 'She killed his son, you know,' he says. 'There was some reason for it, but damned if I know what it was – a disease? Sacrifice?' Here and there, the net catches the sun, glints; most of the fish have strangled themselves, struggling against it. Those more recent are still amidst their private battles: perched up in ragged rows, each with a noose to hang from. She extends her hands, frees them; each dies in its turn. Less and less effort, now, the task drifts toward conclusion without plan or forethought. All the while, her eyes trace across the net; it extends without run or a tear…" (Description of the game character Hiljanharso, AirBuccaneers, 2005)

In addition, the players can choose to play a role of a pilot, an aimer, a fireman, or a loader amongst others. When each player behaves according to her role, they accept and follow a set of appropriate behavioural rules. However, immersing in any of the roles beyond the mechanical performance depends greatly on the player's effort and willingness to do so. *Discovery* and *escapism* were present in a way that the players could freely fly above the mysterious forests and relax and escape from real life problems. *Playing a role* as part of story line or *customization* of the character were not supported at all.

In *Castle of Oulu* the *immersive* elements of the historical setting were enforced on the players. In the beginning of the game all players see a description of the virtual *Castle of Oulu*. The players can not skip this description; however, whether they will use the information in gameplay is entirely up to them. The following text is an example of the premise offered to the players.

> Today an exceptional election for mayor takes place in Oulu. Conventionally six members of the town administrative court vote for the mayor. Today was not supposed to be any different – until alderman Klemet Pörhöi was found from the rive banks, dead; the town doctor was said to believe he was poisoned. A few days later another alderman, Sihveri Juhonpoika, died of spasms in the middle of a dinner. And that same day alderman Martti Pietarinpoika barely escaped from under a falling cargo of stones.Two aldermen are suspected to have been murdered and the third one to have escaped an attempt of murder – no one has a clue of a possible suspect. Consequently the remaining aldermen made an unusual decision: The mayor was to be elected by a large number of esteemed citizens of Oulu in the Labor Day convention. The voting was decided to take place within the walls of the castle in supervision of the town guard. This is how it would be decided which one of the candidates will be the next mayor of Oulu: The present mayor Yrjö Antinpoika or his challenger Henrik Kutha. (Premise from Castle of Oulu, 2005)

More importantly the immersion to the game is designed to happen through the game character. The immersion to the social position and personality of the character lies strongly on the design of the social structures within the game. Every character is a member of a social group, such as town guards, farmers, noblemen or smugglers. The position in the society offers players an idea of acceptable and expected behaviour. For example, the town guard will oversee that laws are obeyed and no crimes are committed. On the other hand, a social position of a smuggler guides the player to break the law and watch out for the town guards. These frames rely heavily on stereotypical idea of how different groups of people behave. The players are expected to generally understand what these stereotypes suggest for their behaviour in the game. In other words, the players who enjoy *role-playing* and escaping real world were the target group of this game.

EXPERIENCES OF ACHIEVEMENT MOTIVATION

Presentation and presence of *achievement* was very clear in the observations and data collected from *AirBuccaneers*. The success of each game was presented as a combination of team score and individual score. The gamers who were interested in *achievement*, especially *advancement* and *competition*, easily found enjoyable forms of play and ways to express skill and power. These players spent a lot of time acquiring skills in manoeuvring the balloon, aiming with the cannon, defending with a musket and managing an air balloon on their own. They also shared tactics and tips on the forums and showed interest in developing the game. In the end, players of this motivational group excelled on many areas and were very efficient fighting even teams of less experienced players on their own. Players who chose to take responsibility of a balloon on their own did not end up choosing one role. They needed to fill all the roles to be successful.

However, due to the fact that the game enforced team play, the players also shared the victory with everyone on the team. For example, a team could have

one very skilled player and six new players. This meant that the one skilled player could not guarantee this team to win. Even if that one player had the highest individual score, the team could still have lost the game. This made the perfecting of skills less important than efficient team work and achievers' experiences might have suffered from it. In addition, the game was designed to support sharing of responsibilities to achieve maximum efficiency. Most players did choose to take part in the action as part of a crew. This did not, however, lead to notable choosing of roles. The players jumped from one role to another constantly, according to each situation. This indicates that choosing role positions was not in any way essential to gameplay and the immersion to the game did not necessarily happen through a specific role position. In addition, the achievement value of a crew with changing positions was not as clear since the result was an outcome of a team effort.

The players of *Castle of Oulu* did experience difficulties in the area of *achievement*. Especially players, who had lots of experience in playing computer games, were confused and displeased. For example, it was difficult to understand how to score points through social interaction. The numerical values of actions were dependent on player's performance in playing the role of the character. If some players chose not to play the roles, others could not fulfil the tasks of their roles. This sort of game design is very risky because success of the gameplay depends on all the players. The individual performance of each player affects the performance of others. In the point of view of an achiever a game like this can feel uncontrollable and, thus, impossible to enjoy. On the other hand, players who had very little or no experience in playing games, as well as younger players in general, were not discouraged by the unconventional *achievement* aspect. In some cases the players were pleased that high skill level on mechanical performance was not required to score points.

EXPERIENCES OF SOCIAL MOTIVATION

Social motivation was one of the key design issues. Especially *teamwork* was supported and encouraged in the gameplay. The players of *AirBuccaneers*, who played the game from all over the world, quickly discovered the benefits of playing together. *Socializing* and forming of *relationships* happened mostly through discussion forums outside the game environment. The strategies were discussed and the game was evaluated together. The relationships formed through these discussions on the forums were brought back to the game. This lead to a birth of crews and frequent players formed clans who practised playing as a team. Some teams often ended up having similar distributions of roles across their crews. In this way the roles on the balloon deck received social content and gave room for expertise (e.g. X is the captain of our clan).

One clear example of possibilities and use of *socializing* is the selection procedure of deck roles in *AirBuccaneers*. One common form of selecting the roles was so called "first come, first served" ideology. Since the balloon did not move until someone was manoeuvring it, the first man to the balloon was

likely to take the position of the captain. The others then filled in the positions at an appropriate time. However, when the skills and interests of the players started to emerge the selection procedure could change drastically. The resulting way of assuming the role positions was through verbal agreement between the players. This type of communication had the biggest influence on how the roles on the deck were assumed. Therefore, the impacts of social interaction between players can be seen as the most effective and successful means for assuming the roles in *AirBuccaneers*.

Castle of Oulu revolved around *socializing* about in-game and off-game subjects. All communication was conducted through speech. Most of the players found social interaction to be one of the most fun features of the game. Yee's descriptions of *social* motivations of players proved to be predominant over the design of the game. Nearly all of the players had friends playing with them and the existing relationships overrode the relationships written into the roles. Furthermore, in many cases the social goals of the roles were ignored and replaced by casual chat. Interacting socially as the game character and through the role was quite rare. However, most players did try to reach some of the goals and all players took part in the mundane task of trading goods.

Since most players did not play the role of their characters, their social status, knowledge of other players and threats were left uncovered. This can also be due to the fact that the players participated in the game only for a short period of time and thus forming of a society or organised action was less present. Although the players did not necessarily act out their roles, they seemed to have formed a clear image of their character.

EXPERIENCES OF IMMERSIVE MOTIVATION

The *immersive* aspects of *AirBuccaneers* became evident mainly through the written descriptions and visual material. The players commented the visual style of the game and the characters on the forums. Thematic success of the environment was evident. The comments, however, dealt mostly with liking or disliking the visual style – not how they affected the assuming of roles. The written descriptions of the setting and the premise of the game were somewhat dismissed by the players. This is most likely due to the fact that all the characters had same skills and the background stories did not affect the gameplay. However, there is one aspect of *immersion* category that seems to have some success regardless of the lack of meaningful gameplay. All meaningful actions had to be performed from air balloons and movement on the ground was limited with two monstrous beings: Ikuturso in the waters and Kirmukarmu on the lands. If a player happened to fall off a balloon to water or land, there was a slight chance for the player to be able to escape the monsters by returning to the base really quickly. Some players, however, would explore the grounds and try out their luck to see how far they could run on the ground before Kirmukarmu caught them. The experience of the lands was meaningless when considering the goals of the game, but it seemed to offer mystery and danger to those who wanted to explore it.

The background stories of the historical setting and the visual style of *Castle of Oulu* received lots of comments. In general the historical look and feel of the place was appreciated. However, access of players was limited to a relatively small space of a courtyard. The immersion of exploration of a continuous world was broken by the limits of it. Many players expressed a wish to explore the environment further and were frustrated by the small area of play.

One of the main goals of *Castle of Oulu* was to offer possibilities to *role-play* a character. The *immersive* aspect of the role was offered mainly through the written descriptions. This form of distributing information posed a problem. Even though the amount of text was minimised, many test players did not concentrate on the description, but chose to, for example, talk to friends sitting next to them. Written information was not considered valuable and therefore it was not important to read it. In other words, this form of distributing roles was not effective. The players have to be motivated to learn about their character and role, to be patient enough to read through descriptions.

In addition to written descriptions, the players were given game characters. The visual appearance of the game characters had great effect on the adaptation of a role for many players. In general, the looks of the characters were not appreciated by the players. Since the game characters were designed to break some stereotypical ideas of how game characters should look like, this is understandable. On the other hand in *Castle of Oulu* the players were not allowed to choose the characters which lead to confusion and even more disapproval. For example, one twelve year old boy had an elderly wrinkled woman as a character and he found it quite hard to assume that role. In some cases, however, the visual appearance of the game character seemed to help in adopting the role. The players, for example, developed personalities for their characters either through their own decision or sometimes through the influence of the other players. In describing their characters they used words like funny, easy-going, calm or annoying. This sort of immersion asks a lot of willingness from the part of the player and in this case the majority of the players were not ready or prepared for role-play on that level.

In addition to visual appearance of the characters, the players could not choose any aspects of the roles. Some roles were seen as easier to appreciate, like the role of a guard due to the functional aspect of arresting other players (familiarity aspect). However, some players clearly stepped into the role and tried to reach the goals of their character as best they could. For example one young boy whose goal was to persuade other players to vote Kutha for mayor, continued the persuasion by shouting endlessly throughout the whole one hour gaming session. Regardless of whether or not this can be seen as an example of role-play, it at least it shows a degree of dedication and immersion in the face of a social task.

DISCUSSION

In this study the design of meaningful roles for game environments was approached through different aspects of roles. Understanding how roles are ap-

proached and experienced in our daily lives, shows us directions to take in designing roles for computer games. Yee's approach to game environments through players' motivations offered a very interesting point of comparison. On one hand we had descriptions of roles and ideas of how to create meaningful roles into computer games. On the other hand we had a model that reveals what motivates players to engage in activities in online computer games. The categories of Yee (*achievement*, *social*, *immersion*) were also used as reference points for different aspects of role definitions.

Two experimental game environments were studied to reveal how design decisions affect the experiencing and assuming of roles. Yee's model as a frame of reference offered a viable point of view to the topic. His categories helped understanding how the players approached different aspects of roles in these two games. In general, the assuming of roles could be discussed with terms presented in Yee's model.

One thing became evident in the analysis of player experiences: No matter how the role was designed and supported by the environments, the motivation of players was the strongest factor in assuming it. For example, *AirBuccaneers* was designed to be a team oriented game. Players, who can be categorised as achievers, did not necessarily participate in team efforts. They perfected their own skills and competed with each other for the highest score and other status prices. On the other hand, the socially pre-designed *role-play* of *Castle of Oulu* did not encourage the so-called socialisers to start playing a role. They just continued casual *socializing* and forming relationships outside the game's objectives, even against the designed social structure. Results like this indicate that the actions and roles the players choose to assume in games are not necessarily the one's intended by the designers. In other words, players who, for example, enjoy exploring the virtual world and discovering places and artefacts can ignore the functional role of the character and disregard the *advancement* in the game. Computer games are recreational by nature and the players seem not to be willing to engage in unpleasant activities.

There are some aspects of Yee's model that need to be considered when interpreting the results of this study. Firstly, Yee's model is created based on contemporary Massive Multiplayer Online Role-Playing Games. Neither of the test environments can be defined as such. The analysis reveals, however, that the motivations of play are present in the two test games. It can be argued, that, the motivations of players might not change due to different game types. Furthermore, MMORPGs do not really utilize and support the play of a role in the same way as *Castle of Oulu* does. The interesting conflict between social play in *Castle of Oulu* and results of players' who enjoy *socialising* reveals, that t is not the act itself, but the meaning behind it, that motivates the players. In other words, social communication with predefined content and meaning does not replace free social interaction. Players who enjoy forming *relationships* in games are not necessarily interested in playing a role with predesigned ones, even though it happens through social interaction. In addition, the test players of *Castle of Oulu* were not role-players. Further study with

appropriate test groups will offer more conclusive data about immersing in a character role in this game.

Another aspect of Yee's model that needs to be pointed out is that the categories are not mutually exclusive. Most players enjoy aspects of all the three categories. These players are willing to try and change roles according to the aspects of game and personal state of mind. Shifting the emphasis of different types of roles can be easy in computer environment, where anonymity is guaranteed and there are no real consequences to abandoning roles or behaving inappropriately according to the definition of the role.

What is, then, the key to forming a meaningful role? As a result it can be safely concluded that the design of meaningful roles does not necessarily guarantee an experience of meaningful role for the player. On the other hand, a design of less than meaningful role can lead to an experience of a meaningful role for the player. Designing roles that have some level of meaning within the gameplay, however, improve the possibilities for player to experience and value the role as an important and personal aspect of a game.

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PART TWO

Bordering Play

INTRODUCTION TO PART TWO

In his book *Homo Ludens – a study of the play element in culture* (1955), Johan Huizinga argued for the inseparability of play from culture and vice versa, and mentioned magic circles among the arenas in which play can take place. The term has since been picked up by many theorists and used in a more abstract sense, referring to a sphere or domain of play in both space and time. For Huizinga, it seems to be important that the borders of a magic circle and the rules of play are defined before players set out to play. A certain debate (see e.g. Salen & Zimmerman, 2004, pp. 93-99, Copier 2005, Pargman & Jakobsson, 2006) has hovered around the concept of a magic circle, regarding the demarcation of the domain of play – who or what is the one that draws the line between play and non-play, or game and non-game.

Such debate is valuable as it secures the ontological foundations of concepts used in game studies and contributes to the unfolding of the ways in which games connect with the realities of their participants. Regarding the practices and lived experience of play, the border between play and non-play is, in both experiential and cultural senses, rather dynamic if not elusive. As Taylor (2006, pp. 151-3) notes, "virtual" spaces leak over into "real" worlds and the practices of play are integrated with those of everyday life.

Beginning with the launch of games like *Ultima Online* (1997) and *EverQuest* (1999), the past decade has witnessed the growing success of massively multiplayer online games (MMOGs), due to which the social, ethical and economical issues arising from the differences between the "real" and the "virtual" concern an increasingly large number of people. MMOGs also prompt revisiting the conceptions of the rules of a computer game. While a player in a single-player game is free to break the rules at will, the players of many subscription-based online games act within frameworks defined by Terms of Use and End-User License agreements. These can be seen as examples of the game rules claiming new territory from a larger socio-cultural domain. It would be rather tempting to conclude that in MMOGs, the magic circle is demarcated not only by the players and/or the game before the start of play, but ultimately by a corporate game master who adjusts the perimeter of the magic circle in

real time and whose choices, often expressed in the form of legally binding agreements, are anything but apolitical.

The second part the book, Bordering Play, discusses the conceptual and practical overlaps of games and everyday life and the impacts of setting up, crossing and breaking the boundaries of a game and non-game. Chapters in the second part look at activities, practices and approaches, all somewhat offbeat, which aim to alter the experiences of involved players and demonstrate certain breaks from the idea of games as enclosed and self-contained. The players are seen primarily as social and cultural beings, participants in circles where it is not always clear who is in control.

Brian Jennings writes about otherness in the context of the social experience of playing and the role of other players in forming such experience. As language has replaced physical difference as a sort of signifying shorthand for identity in contemporary online games, notions of race and ethnicity have entered the playing field. Using *World of Warcraft* (2004) as an example, Jennings discusses otherness in relation to the Terms of Use agreement and the players' competences in using the English language. With reference to the practice of "gold farming", he examines the practice of "othering" taking place in the game.

Gareth Schott looks at the analytical and interpretative media tools the players of *World of Warcraft* use when documenting events inside the game. Among other things, he observes that in the same way as photographs are taken at birthday parties, players document their key moments in the game. Seeing the documentative practices as resembling an "anthropology of ourselves", an effort of the British Mass Observation movement in the 1930's, Schott examines the practices of articulating and conceptualising the inhabitation of a virtual world that is constructed by its developers as a designed experience. In this analysis intertextual connections, with traditional media texts, appear.

Julian Kücklich's chapter focuses on cheating in single-player games. He presents cheating as an issue which is often brushed aside but is still important to study in order to understand the variety of experiences games have to offer. What is common to all forms of cheating is that they alter the way players experience the game. It changes either the look and feel of the game or the abilities of the player's avatar. Cheats can be genre-related, but also non-generic, can interfere with the game's background and refer to the cyborgian nature of a computer game player. By discussing examples from *Deus Ex* (2000), Kücklich distinguishes different types of cheats based on how they extend the player's possibilities.

Thomas Duus Henriksen looks at the player's experience as extending to cover everyday life, and the implications such extension has for a (serious) game's abilities to address real-world issues. The empirical cases in this chapter are two implementations of EIS Simulation, a serious game about change management. In a particular understanding of learning games, setting a scene for a deviation from optimal experience can to be beneficial. Rather than bringing reality into games, Henriksen suggests that games should be staged in reality.

In the final chapter of second part, Pau Waelder Laso, uses *PainStation*, an artist-built game console, to explore the limits of the concept of a game as fun and harmless. Waelder points out the importance of the social dimension in the *PainStation* duels, as he observes players' experiences with PainStation as leaving traces, both cultural and physical, which can be compared and discussed with other players within and outside a particular playing session.

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Brian Jennings

WTFpwned by Chinese Gold Farmers: Translating "Otherness" into Synthetic Worlds through Culture and Language Hierarchies

> Everything that happens in a synthetic world is the consequence of the interaction of human minds, and our minds have things like Love, Property, Justice, Profit, War, and Exploration hard-wired into them. We could not create a world and put people in it without also enabling sex, trade, and battle. Whatever physical environment and object-set we create, once populated, will be forced to play host to a full spectrum of personal emotions and interpersonal relations. Such places may be physically strange, but they must be human [...] events in synthetic worlds claim serious attention not just because they are human, but also because they may have effects that radiate outward into the ordinary world (Edward Castronova, 2005, pp. 48-59, 50)

> Racial imagery is central to the organization of the modern world [...] The myriad minute decisions that constitute the practices of the world are at every point informed by judgments about people's capacities and worth, judgments based on what they look like, where they come from, how they speak, even what they eat, that is, racial judgments (Richard Dyer, 1997, p. 1)

> It should be obvious that access to the means by which ideas are disseminated in our society [...] is not the same for all classes. Some groups have more say, more opportunity to make the rules, to organize meaning, while others are less favorably placed, have less power to produce and impose their definitions of the world on the world (Dick Hebdige, 1979, p. 14)

It may come as a surprise to some, but there are a lot of people who spend a lot of time playing online games. The juxtaposition of the phrase "online games" with "a lot of people" could potentially lead to certain inferences about exactly what kind of people these are – perhaps slide-rule toting white males, or socially awkward teenagers holed up in a parent's basement comes to mind – inferences that are not necessarily representative of the quickly expanding and evolving market for online games. In a recent consumer survey conducted by ESA (Entertainment Software Association), the trade association of the computer and video game industry in the United States, it was revealed that while there are many teenagers that play video and online games,

the majority (62%) are over 18, with the average age of the game player being 30. In fact, 19 percent of those that regularly play are over the age of 50 (Essential Facts About the Computer and Videogame Industry, 2005). Additionally, while there are more men than women that play, it is a relatively small difference with a gap that is expected to steadily decrease as the video and computer game industry learns to better court women as an audience (Dickey & Summers, 2005).

Misconceptions about who is playing online games does not end with stereotypes about age and gender demographics; online games such as *World of Warcraft* (2004), *Dark Age of Camelot* (2001), and *Vanguard: Saga of Heroes* (2007) have large international followings and include people from all socioeconomic strata, race, sexual orientation, and religious affiliations. Websites for these games are available in numerous languages where people from all over the world can talk about everything from game strategy to displaying fan created art.[1] According to DFC Intelligence, an organization that tracks the computer gaming market, "more than 100 million people worldwide [are] logging on every month to play interactive computer games" (Barboza, 2006).

In addition to misconceptions about who is playing, there is, perhaps, confusion regarding what sorts of activities occur and the investment that players put into these games. The January 2003 edition of *Wired* had an article about a man named John Dugger, a Wonderbread deliveryman, who "logged on to eBay and, as people sometimes do these days, bought himself a house" in an "excellent location [...] nestled at the foot of a quiet coastal hillside, the house was just a hike away from a quaint seaside village and a quick commute from two bustling cosmopolitan cities" (Dibbell, 2003). The house that he purchased for $750, representing a week's wage for Dugger, did not exist anywhere in the real world – but in the fantasy realm of Britannia, located on a server for the game *Ultima Online* (1997). Dugger's $750 house purchase was later dwarfed by the media coverage of the purchase of an island in the game *Project Entropia* (2003) for a reported $26,500 – more unbelievable perhaps is that the purchaser bought the island with the intention to "sell plots to people who wish to build virtual homes" and "tax other gamers who come to his virtual land to hunt or mine for gold" (Gamer Buys $26,500 Virtual Island, 2004). The purchase of a "pleasure paradise" space station in the same game in the fall of 2005 for $100,000 to take advantage of virtual "mining and taxation rights" as well as a "mall shopping booth and market stall owner deeds, a land management system, a billboard marketing system, and space station naming rights" (Gamer Buys Virtual Space Station, 2005) indicates that the people who plays these games take the virtual worlds that they inhabit seriously enough to invest large amounts of money to enhance their gaming experience and the quality of their virtual lives. The economic activity generated in-game by players of online games – that is the "buying and selling of money and other virtual items" – amounts to "at least $30 million annually in the United States, and $100 million globally," (Castronova, 2005, p. 2)[2] rivaling the GDP of some African nations (Virtual Gaming Worlds

Overtake Namibia, 2004). Rather than being an isolated community or marginal group, online games have attracted a broad range of people who meet in a synthetic space and interact in much the same way that people do in real life – fighting, falling in love, and dabbling in land speculation.

Focusing on one game in particular, *World of Warcraft* – which can be described as an MMORPG (Massively Multi-Player Online Role Playing Game), an "online computer role-playing game in which a large number of players interact with one another in a virtual world" – it is possible to address with some specificity questions about who is playing and what it means culturally and socially to be a member of an online community that is centered around one of these games. After establishing that online games, such as *World of Warcraft*, are important sites of social interaction and cultural creation, I will examine the way that the real world notion of "otherness," as defined by cultural critics, is translated into and practiced by people in the game world. In particular, I will address the management and articulation of a discourse of difference or "othering" practiced by players against other players (and to a lesser degree the creators of the game) and point to possible reasons why this occurs.

World of Warcraft, commonly referred to in the game and on the internet as *WOW*, is an MMORPG that was developed by Blizzard Entertainment and distributed in the fall of 2004. According to the game's official website,

> In World of Warcraft, thousands of players will have the opportunity to adventure together in an enormous, persistent game world, forming friendships, slaying monsters, and engaging in epic quests that can span days or weeks. (FAQ, 2006)

In addition to a player's ability to explore the video game world, fight monsters, go on various quests, and even learn a trade like tailoring or blacksmithing, a player shares the world with thousands of other players. In fact, the social aspect of the game is an important part of the world's design and perhaps one of the things that many players find most enjoyable and invigorating about playing. Although the content of the world does not ordinarily change from day to day, the presence of thousands of individuals interacting with the game world and each other provides a source of variety that keeps the game interesting even after hours of doing repetitive tasks. Blizzard notes that,

> World of Warcraft is an online game with thousands of players, so naturally the game is built to facilitate extensive in-game socializing. You can search for players easily by key words, looking for those in your same zone or with certain names. You can also add players to a friends list, so you can keep track of nice and helpful players for grouping or just talking. Grouping is simple as well. Many quests are designed to be accomplished with other players, and you'll therefore want to seek out the help of other characters. (Basics, 2006)

There is an in-game chat panel that is the primary means of communicating with other players while you are in the game world. You can talk in a general chat where hundreds of people can potentially read what you type, or you can type messages that only members of your questing party or guild can read. You can even "whisper" to a single person to carry on a private conversation to which only you and another player are privy. Another way that people often communicate with each other in the game world is through the use of Voice over Internet Protocol (VoIP) group communication applications such as *Teamspeak*[3] or *Ventrilo*[4], which allow large groups of people to speak to each other simultaneously on a network. Additionally, Blizzard hosts moderated forums that allow players to log on as the characters they have created to make and respond to posts in any number of discussion threads dealing with the game or any other issues that players feel like discussing.[5] A large part of the game experience is spent communicating with your "friends:" working with them, helping them complete tasks, or, perhaps, making fun of someone else's inability to function well in the game world.

The game, at its most basic level, is designed around a cooperative model where players help each other complete tasks in order to benefit the individual player in the form of getting more experience, better equipment, or more gold. Much of the game, as indicated by the game's website, is specifically designed with groups in mind. Most of the content that is available for players who have gained as many levels as the game allows[6] is only accessible through cooperating with a coordinated group of dozens of other players. The basic assumption is that if a player has progressed to that point he/she will have learned how to work with others and be familiar enough with the way the character works to be beneficial to his or her group. A large part of being successful in the game, especially at the later levels, depends on one's ability to communicate and work cohesively as a group.

Although *World of Warcraft* is Blizzard Entertainment's first foray into the world of MMORPGs, they have proven to be incredibly successful at attracting a market. According to a recent article in *Business Week*,

> Blizzard's World of Warcraft game has 5.5 million global subscribers paying about $16 a month to interact with thousands of other gamers in this fantasy world. That game, which is rumored to have cost $55 million to create, is generating approximately $50 million in monthly revenue and will bring in close to $1 billion in a full year. (Gaudiosi, 2006)

In a press release that followed the launch of the expansion, *The Burning Crusade* (2007), Blizzard officially announced that the player base had surpassed 8.5 million subscriptions (*World of Warcraft*: The Burning Crusade Continues Record-Breaking Sales Pace, 2007) with more than 2 million subscriptions in North America and 3.5 million in China (*World of Warcaft* Surpasses 8 Million Subscribers Worldwide, 2007). Like other popular online games, *World of Warcraft* has managed to attract a large and loyal fan base that pays a monthly subscription fee in order to interact with others in the game world

and on the game's community boards. For many who play *World of Warcraft*, the game and its back-story and bevy of characters, the social milieu of the server where a player has created characters, and the online zeitgeist serve as an important locus of social interaction as well as the inspiration for the creation of game specific cultural artifacts.

In much the same way that cult fans of other media such as television or movies create fanfic and artwork about the subject of their obsession, many *World of Warcraft* players experiment with extending the hyperdiegesis (Hills, 2002, p. 137)[7] of the game world by creating movies[8] that articulate the exploits or personal histories that they have created for their characters. Others create original artwork, or speculate on the directions that the *World of Warcraft* storyline could potentially go by creating their own narratives. The world created by Blizzard, much like traditional cult texts in television and film, offers a setting that "reward[s] re-reading due to its richness and depth" leading to "stimulating creative speculation and providing a trusted environment for affective play" (Hills, 2002, p. 138). Rather than merely being a flat, two-dimensional representation of a reality, the game world is extended beyond the game itself when players create and interact with cultural artifacts inspired by their experience within the game, with the story, or with others they have played with. Although Henry Jenkins and others[9] have discussed in great detail fandom and fan culture, much of that discussion has focused on media such as comic books, television and movies. Admittedly, there is much cross-over between fans of cult media and online games, but the social experience engendered by an online world is different enough – replete with its own unique system of signs and meanings as well as social codes – to warrant additional and more specific scholarship.

In addition to being the impetus for cultural creation, the game world also acts as a public forum and an important site of social interaction for many of the players. A recent article on CNET documents the story of a *World of Warcraft* guild called "We Know" that begs the question of whether online games could be the "new golf,"

> Sure, it has about 100 members, some of them wealthy, a few of them wildly wealthy. On the membership roster are at least 10 people who have the letter "C" in their job titles. And members of this particular club say they've joined so they can bond with friends and other like-minded people. But there's one big difference between "We Know" and famed clubs like San Francisco's Olympic Club and the New York Athletic Club: "We Know" exists only in the virtual world. It's one of many virtual guilds, or groups of kindred players, in the popular "World of Warcraft" online game. (Terdiman, 2006)

The guild, which includes a "concentration of movers and shakers in the technology world," represents a space where like-minded people can get together and talk shop while playing the game. In much the same way that important deals have been made over a round of golf in the real world, these technology CEO's and industry insiders will often cook up business schemes and then

discuss them in guild chat for feedback, "I can throw out a blog idea . . . to people who would actually know what I'm talking about while I'm running around hunting ox or something" (Terdiman). A similar dynamic is found in many of the guilds that are created in *World of Warcraft*; individuals band together in game space because of some shared common interests that they have outside of the game. Guilds are often created by groups such as firemen and individuals in the military as well as by people who are interested in the same kind of music or who speak a certain language.[10]

By the same token, divergence of common interest, worldview, or language can be the cause of rifts between individuals and groups. It is a common practice to kick people out of a guild if they do things that are perceived as negative to the majority of guild members; this could include constant swearing, using derogatory racial epithets, or having your character power-leveled by a company that specializes in getting your character to the highest level in the shortest amount of time (Barboza, 2006)[11] – all activities which are often frowned upon by many in the gaming community. It is also possible to put people whom you have found offensive or otherwise not to your liking on an "ignore" list, which makes it impossible for them to talk to you, or for you to even see the things they say in the chat field.

Another important element that has a powerful influence on the dynamics of the game world – buffering it in a sense from the real world – is the TOU (Terms of Use, 2006) that every player agrees to abide by, and the way that the TOU are enforced by Blizzard GMs (Game Masters) (What Does a GM do?, n.d.)[12]. The rules of the TOU are designed to preclude any activity that would mar the game playing experience of anyone else – I will focus on the elements of the TOU that specifically deal with naming and chat rules, as these represent the primary means by which players represent themselves in the online world. Regarding naming, the TOU in part states that,

> When you choose a character name, create a guild, or otherwise create a label that can be seen by other players of World of Warcraft, you must abide by the following guidelines as well as the rules of common decency. If Blizzard Entertainment finds such a label to be offensive or improper, it may, in its sole and absolute discretion, change the name, remove the label and corresponding chat room, and/or suspend or terminate your use of World of Warcraft.

In particular, you may not use any name:

> [...] That incorporates 'swear' words or which are otherwise offensive, defamatory, vulgar, obscene, hateful, or racially, ethnically or otherwise objectionable [...] Belonging to any religious figure or deity [...] Related to drugs, sex, alcohol, or criminal activity [...] (2006)

For the most part, in my own experience and from what I have understood from the experience of others as posted in forums, the notion of abiding by a general sense of the "rules of common decency" characterizes Blizzard's posi-

tion on the policy of naming both guilds and characters. The rules that are laid out in the naming policy generally try to stamp out any and all controversial, bigoted, offensive, or prejudicial name or potential name that a player could choose.

On one server where I started a new character, a guild was formed that was called "Dubya Tee Ef" – which is a phoneticization of "wtf," Internet parlance for "What the fuck?" The guild was not around more than a week or two before it was either reported by a player (perhaps the most common way of bringing TOU violations to the attention of Blizzard) or a GM noticed it and disbanded the guild. Another common guild name that is present in one iteration or another on multiple servers is "Wehavecandygetinthevan" – or, We have candy get in the van – a "humorous"[13] reference to child kidnap and molestation which is meant to communicate to those that they fight against that they will similarly be taken advantage of or overpowered. Usually, guilds with such obviously sexually charged and/or violent language do not last long. While the aforementioned guilds did not persist, on a different server a guild named "Ching Chang Chinamen" – a negatively charged moniker that could be considered a racial epithet by many – existed for several months without being disbanded despite being an obvious violation of the TOU. What is interesting and most telling about the contours of permissibility created by the application of the "rules of common decency" and the culture that gives those rules meaning are the naming and chatting practices that could be construed as offensive but, for whatever reason, are never subjected to the same punishment or penalties as other practices which are deemed offensive.

As a test of the character naming rules, I created a character and named him "Whitetrash" – a clear violation of the "racially, ethnically or otherwise objectionable" clause of the TOU. I played on this character for about a week before I received the following email,

> Greetings Brian,
> Account Name: -------
> Realm: Staghelm
> Character Name: Whitetrash
>
> Account Action: Warning
>
> Offense: Inappropriate
> This category includes both clear and masked names which:
> . Are mildly inappropriate references to human anatomy or bodily functions
> . Consist of any alphanumeric character not normally found on a standard 101/102 key keyboard (O§iri§, Yelena, Jason; Does not apply to Guild or Pet Names unless used to impersonate an existing guild)
> . Are references to illegal drugs or activities
> . Have neutral or positive racial/ethnic/national connotations
> . Have neutral or positive connotations of major religions or religious figures (i.e. Jesus, Christianity, Buddha)

> . Include names of World of Warcraft realms, zones, or names of major characters from Warcraft lore
> . Are otherwise considered inappropriate for the game world
>
> The name selected for this character has been deemed as inappropriate for the World of Warcraft by the In-Game Support staff of Blizzard Entertainment. Upon your next log-in, you will be prompted to select a new character name. (Email from wowaccountadmin@blizzard.com, October 14, 2005)

I was not surprised to receive the warning and notification to change my character's name as it has racial connotations that could be construed as negative by the "rules of common decency." What the email does not indicate, however, is the fact that many naming violations occur which seem to go below the radar of the "rules of common decency", perhaps because the majority of players do not recognize or find offensive what could be construed as prejudicial to certain minority groups. The name "Whitetrash" is prima facie offensive to most white people, who probably make up the majority of *World of Warcraft* players on US servers.[14] On the other hand, I have seen players go for months with no disciplinary action with names like "Yahweh," the name of God in the *Torah*, "Pantyraider," perhaps suggesting sexual promiscuity or prowess, and "Stynkfyst," referencing an erotic sexual practice. All three of these terms, as names of characters, appear to be at odds with the TOU, but because they do not at some level register with the general populace as contravening the "rules of common decency," these names are not reported. When I asked the player named "Yahweh" if he knew that his character's name could be offensive to Jewish people, he/she replied, "I know, I don't care." In this way – through an uneven, often unintentional enforcement of the TOU regarding the creation of names – a sense of "otherness" and a sense of privilege for certain groups of people are carried over from the real world and inhabit the synthetic world.

I use the word "otherness" as it is commonly employed by cultural critics who have addressed issues of postcolonial thought in related fields, such as Edward Said and Gayatri Spivak. "Otherness" occurs or is enacted when the policies, practices, and/or culture of a dominant group habitually exclude, demoralize, debase or disfigure other groups in order to ensure the dominant group's cohesiveness and identity. While I am familiar with the tradition of postcolonial critiques of ideological imperialism and violence in literary and film studies, I am going to take the advice of David Bordwell and avoid the impulse to start with the theory and make my empirical data match up (Bordwell, 1996). Methodologically this is necessary because I am examining with specificity the intersection of "otherness" and the medium of online games – a burgeoning field that is just beginning to produce theoretical writings that address the unique experience of online gaming.

While the inequity of the TOU enforcement for naming underscores tension between a sense of "otherness" and a sense of privilege in the game world, it is in the actual communication via chat that a language of difference or "othering" is most apparent. The TOU rules regarding chat have a similar

objective as the rules for creating character and guild names, that is, to exclude any potentially disruptive element that could mar most players' ability to enjoy the game,

> Communicating with other Users and Blizzard Entertainment representatives is an integral part of World of Warcraft and is referred to in this document as "Chat." Your Chat sessions may be subject to review, modification, and/or deletion by Blizzard Entertainment without notice to you. Additionally, you hereby acknowledge that Blizzard Entertainment is under no obligation to monitor Chat, and you engage in Chat at your own risk. When engaging in Chat in World of Warcraft, or otherwise utilizing World of Warcraft, you may not:
>
> Transmit or post any content or language which, in the sole and absolute discretion of Blizzard Entertainment, is deemed to be offensive, including without limitation content or language that is unlawful, harmful, threatening, abusive, harassing, defamatory, vulgar, obscene, hateful, sexually explicit, or racially, ethnically or otherwise objectionable [...] Harass, threaten, stalk, embarrass or cause distress, unwanted attention or discomfort to any user of World of Warcraft [...] (Terms of Use, 2006)

Note that Blizzard specifically states that they are "under no obligation to monitor chat, and [that you, the user should] engage in chat at your own risk," (2006) indicating that, again, this notion of "common decency" vis-à-vis the majority of players, is the guiding principle behind what you can and cannot say in chat. Additionally, because of the ephemeral nature of something such as chat – combined with the fact that most people who are in the game are usually busy completing a task or going from one location to another, it is possible to say something that is far outside of what could be construed as conforming to "common decency" with essentially no fear of reprisals from GMs or other players.

Two of the ways that the rules about chat are regularly broken are in regards to sexual orientation (i.e., negative comments about homosexuality or women) and ethnicity. Although references to African-Americans and Latinos are less common and more often frowned upon, Chinese people are regularly and freely disparaged as being "farmers" who destroy the quality of game play for "everyone," read – a mostly white, male, middle class player base. Between remarks made about homosexuality and "gold farmers," comments that disparage Chinese people and culture are much more commonly made without any sort of response from players or GMs – due in large part, I feel, to the fact that they are not able to address much of the criticism that is directed at them. Many lack the English ability to adequately defend themselves and cannot overcome the hegemonic "common sense" (Williams, 1977) that all people that cannot speak English are gold farmers or power-levelers,[15] *ergo* are in some way disrupting "everyone's" ability to enjoy the game. Additionally, while many of the English-speaking players are preternaturally aware of issues of race and prejudice because of the attention of the media and popu-

lar discourse, much of that discourse has focused on African-Americans and Latinos while China is often demonized and figured as a challenger to the economic and cultural primacy of the United States (Erard, 2006).[16] The material consequence of this dynamic on the game is that negative remarks can be made about Chinese people/"farmers" with very little response while racially charged comments about African-Americans or Latinos are often met with vigorous and vituperative attacks on the one who makes the offensive comment.[17] Rather than being based on physical appearance, the "otherness" of non-native English speakers is inscribed onto their avatars according to their inability to navigate Western language and culture.

The notion that all Chinese players are gold farmers, and by association anyone that cannot adequately express in English that they are not Chinese, is in large part a result of wide media coverage regarding the proliferation of digital Chinese sweatshops – where everything from gold to items are farmed hour after hour by low paid Chinese workers and then sold through a clearinghouse such as IGE[18] or on EBAY.[19] Many feel that farming practices such as these destroy in-game economies, making it almost impossible to legitimately compete with other players who have simply purchased what would ordinarily take weeks and sometimes months to obtain (Vedermen, 2006).[20] In addition, by flooding the game with currency, the in-game prices for goods and services are often times astronomical. It is understandable that some might take umbrage at the fact that a service that they are paying for is being marred or disrupted. The danger in this instance, however, is the way that the popular consciousness of the people who play games like *World of Warcraft* often conflate the identity of a few despised and ethically questionable people[21] onto a whole race.

The opprobrium with which a vocal segment of the *World of Warcraft* and greater online gamer community have used to characterize and ethnicize the issue of gold farming has created an environment that is hostile to Chinese players. Chinese players have tried to speak to this issue,

> Chinese World of Warcraft players are being discriminated against by English speakers who assume they're all gold-farmers, according to reports on Chinese-language website Tales of Warcraft. More than 7,000 posters on the site's forum claim they have fallen victim to the problem, which is said to occur when Chinese players attempt to join groups. Apparently there is a common belief among English speaking players that most non-English speakers are gold farmers and are only playing for commercial gain.
>
> As a result, players are asking anyone who wants to join a group to type one or two sentences in English. If the sentences contain spelling or grammar mistakes, the player is rejected. Since you have to join groups to complete certain quests in WOW, this is presenting many Chinese players with a serious problem. (Gibson, 2006)

The fact that there were more than 7,000 posts complaining about racial discrimination indicates that the characterization and discourse of difference perpetuated via chat and other exclusionary grouping practices is having a palpable effect on many Chinese player's ability to enjoy the game. Also, any possibility of success in altering perceptions of Chinese players is grim at best as they are not able to directly address the problem in the communicative apparatus provided by the game or take part actively in the larger gamer community as a result of the language barrier. For many players, the game world is, perhaps, the only interaction that they have ever had with Chinese people. There is a real danger for many players of formulating negative ideas about what it means to be Chinese because of the pervasive and at the same time blasé comments that appear regularly in game chat, on forums, and in the gamer media generally.

There are countless examples in game and on various forums dealing with *World of Warcraft* that illustrate the "common sense" notion that has developed regarding either negative playing practices (i.e., gold-farming, "ninjaing" or stealing items, not following instructions, etc.) or inability to communicate well in English with being "Chinese." In a thread on www.worldofwar.net where a regular poster has been the target of Blizzard GMs for alleged gold-farming, the poster defends himself by claiming that he is not "some fat Chinese kid with no life." When a poster to the forum questions the use of such pejorative phrasing another poster defends the original poster's characterization,

> Baal: I'm sorry - but I have to ask what being a "Fat chinese kid" has to do with anything?
> That seems like a very racist, and pointless comment that had absolutely nothing to do with what was going on.
>
> Hayek: Yes and no. Sad fact about the state of WoW is that a lot of the goldsellers are clearly chinese, as proven by character names such as xiaoyang and common mistakes in their english. Fact is also that the goldselling companies buy the services of chinese subcontracters who farm the gold.
>
> Not all Chinese (on the european servers, we're not talking about the commie or Taiwanese servers here) are goldsellers, but pretty much all commercial goldsellers you come across are identifiably chinese. (World of War.Net, April 27, 2006)

Hayek's response to Baal in this forum post is representative of the general attitude of many who post on forums dealing with *World of Warcraft* about Chinese players. There is some player awareness, as illustrated by Baal's comments, that it is not fair to essentialize or make racist comments about Chinese people or players. For the most part, however, calls for greater awareness or a more open-minded approach to dealing with Chinese players or other

players that do not speak English well are met with rationalizations like those in Hayek's reply – common mistakes in English equates to Chinese which translates into a group of people who are destroying your game play. In an environment where language has replaced physical difference as a sort of signifying shorthand for identity, the ability to navigate the game world and its internet counterparts in English operates in much the same way as whiteness does as a physical marker in the "real" world (Dyer, 1997, p. 1). Game space is claimed by and belongs to those with the access to English, while those who lack the proper language skills are outsiders whose presence is questionable and not as valid – the centrality of English as a marker of "properness" has become naturalized.

The centrality of language and the major role that the textual experience has in game space, especially as a means of alternately dividing and uniting groups of players based on their access to language, is demonstrated by the recent incident where a player, Sara Andrews, was given an email warning from Blizzard for advertising her "gay, lesbian, bisexual, and transgender 'friendly' guild" in general chat (Ward, 2006). According to Andrews, she received an email that accused her of violating the TOU in regards to "Harassment – Sexual Orientation… This category includes both clear and masked language which insultingly refers to any aspect of sexual orientation pertaining to themselves or other players" (Terms of Use, 2006). Andrews felt that in advertising her GLBT friendly guild she had not disobeyed the TOU stipulation regarding harassment and proceeded to exchange several emails with Blizzard in attempt to come to an understanding. Initially, Blizzard was unmoved,

> While we appreciate and understand your point of view, we do feel that the advertisement of a 'GLBT friendly' guild is very likely to result in harassment for players that may not have existed otherwise. If you will look at our policy, you will notice the suggested penalty for violating the Sexual Orientation Harassment Policy is to 'be temporarily suspended from the game.' However, as there was clearly no malicious intent on your part, this penalty was reduced to a warning . . . it may incite certain responses in other players that will allow for discussion that we feel has no place in our game. (Sliwinski, 2006)

Blizzard's rationale for censuring Andrews was essentially a proactive move to cut off anticipated backlash from "normal" players against members of the GLBT friendly guild. The "rules of common decency" seemed to suggest that the mere mention of homosexuality was offensive and the Blizzard GMs dealing with Andrews's case were not open to discussion.

The issue of homosexuality and notions of "otherness" is a broad topic in and of itself – what is most remarkable about the case of Sara Andrews and her GLBT friendly guild vis-à-vis the outsider status of non-English speakers in the game is the way that Andrews was able to engage both the gamer community and Blizzard after her initial rebuff. After exchanging several emails with Blizzard GMs and getting nowhere, Andrews took her fight to the Internet and the gamer community. She published her emails and Blizzard's responses

on the Internet and got other large "gay friendly" guilds involved in a letter writing campaign (Sliwinksi). Andrews posted in numerous *World of Warcraft* forums and, after explaining her side of the story, for the most part received support and encouragement from the gamer community. Several news sites picked up the story and Lambda Legal, a legal gay rights group, in support of Andrews contacted the president of Blizzard, Paul Sams, indicating that the mere mention of sexual orientation could not be construed as harassment – suggesting the potential for litigation on Andrews's behalf (Blizzard's Reaction, 2006).

Shortly after being contacted by Lamda Legal, Paul Sams issued a statement recanting the GMs initial ruling on the issue, terming it an "unfortunate mistake,"

> Although Blizzard is well within its rights to insist that players avoid referring to other gamers in an "insulting manner," Blizzard cannot issue a blanket ban on any mention of sexual orientation or gender identity [...] Blizzard strives for a game environment in which everyone can feel welcome. With that goal in mind, Blizzard's in-game policies prohibit harassment of other players in general, and specifically prohibit harassment of other players based on their sexual orientation.
>
> As a "massively multiplayer" online game, WoW provides a social environment for players to interact with each other. It is expected and accepted that players will discuss a wide variety of topics, based on both the game world and the real world. (Blizzard's Reaction, 2006)

Whether it was the threatened litigation or the belated realization that there had been a misapplication of their own rules, Sams apologized and reiterated Blizzard's position that they are opposed to "harassment of other players in general" and specifically "based on their sexual orientation" (Blizzard's Reaction, 2006). Blizzard's acknowledgement and mea culpa has probably done little to curb the rampant homophobia and gay bashing present in general chat (Peckham, 2006), but Andrews was able to score something of an ideological victory for gay rights in the game. The knowledge that there is a viable means of recourse for players who have an interest in protecting the ability of GLBT "friendly" players to enjoy the game – that those players are not totally marginalized is a result of Andrews and her sympathizer's ability to effectively navigate the lingual landscape and draw attention to their cause.

Unlike the 7,000 Chinese posters at Tales of Warcraft (Gibson, 2006) who reported abuse and voiced their concerns in Chinese and apparently never had those concerns addressed, Andrews was able to elicit a response from the Blizzard president and have some game mechanics altered to accommodate her search for potential GLBT friendly guild members. Although English speaking GLBT friendly players are likely still marginalized to some degree by many of the other players through the use of pejorative terms, because they can handily navigate game space in the dominant language of U.S. servers,

they are not ostracized to the same degree or in the same manner as those without a certain level of access to English. In *World of Warcraft* it appears that the operation of "otherness" is more dependant on and a function of language access rather than lifestyle.

As synthetic worlds become increasingly populated it is important to remember, as Edward Castronova has pointed out, that despite their inherent virtuality, such spaces are still "human" (48). While this fact makes synthetic worlds compelling sites of socialization and interaction, it also makes them subject to many of the fault-lines – ideological and otherwise – that exist in the real world. Just as in the real world, some groups have more and better access than other groups in determining the contours of permissibility: what is punishable and who is punished. Some critics, such as Richard Dyer and George Lipsitz, would suggest that race is the "unmarked category against which difference is constructed," serving as an unacknowledged "organizing principle in social and cultural relations" (Lipsitz, 1998). In a video game world, where you never actually see the other person, how is it possible for race/ethnicity to play a major role in social and cultural relations? The short answer appears to be language.

NOTES

1. There are examples of this found all over the internet. A popular strategy site can be found at http://vnboards.ign.com/World_of_Warcraft_Main_Boards/c14461/, and a popular site for fan art can be found at http://www.warcraftcentral.com/gallery/fanart/, Last checked March 19, 2006.

2. In a recent study commissioned by Activision, this figured has been estimated at closer to $1 billion a year.

3. Teamspeak Available at: http://www.goteamspeak.com/, Last checked March 19, 2006.

4. Ventrilo Available at: http://www.ventrilo.com/, Last checked March 19, 2006.

5. World of Warcraft Forums Available at: http://forums.worldofwarcraft.com/, Last checked March 19, 2006.

6. In World of Warcraft you kill monsters and complete quests to gain experience. After accumulating enough experience you gain a level – which is a milestone of sorts, giving players increased abilities. Initially in World of Warcraft level 60 was the highest level that a player could achieve – taking any where from a week to several months depending on the player. The recent expansion, The Burning Crusade, raises the level cap to 70.

7. Hills notes that, "Another defining attribute of the cult text is hyperdiegesis: the creation of a vast and detailed narrative space, only a fraction of which is ever directly seen or encountered within the text, but which nevertheless appears to operate according to principles of internal logic and extension."

8. World of Warcraft Movies Available at: http://www.warcraftmovies.com/, Last checked March 20, 2006. There are literally thousands of player created videos dealing with any number of topics – many of which have been downloaded hundreds of thousands of times.

9. After the publication in 1992 of Henry Jenkin's Textual Poachers: Television Fans and Participatory Culture, many others have done case studies and other work that addresses the notion fandom and participatory culture – mostly dealing with television and movies.

10. Renaissance on the European Shadowsong server is a guild for people who speak Russian, http://www.shadowsongeurope.com/index.php?option=com_content&task=view&id=17&Itemid=30&gid=94345, Last checked March 19, 2006. Guilds for various groups, such as firemen, policman, and other occupations are regularly advertised at http://forums.worldofwarcraft.com/board.aspx?fn=wow-guild-recruitment.

11. "It costs $269 to be transported to Level 60 in Warcraft, and it typically takes 15 days to get the account back at the higher level."

12. "Game Masters are there to help and to enhance your playing experience. If you are having any problems with the game or with other players you can contact a GM for prompt and courteous assistance."

13. When I questioned a member of the guild "Wehavecandygetinthevan" about the motivation/meaning of the guild name, they replied that it was "humorous."

14. Although it deals with console video games, the report found at http://www.alexassoc.com/games/GDmemo.shtml#demo demonstrates that there is a marked disparity between white households and African-American households vis-à-vis video game consumption. In addition, although Asians represent a large portion of the World of Warcraft market, 3.5 million Chinese out of 8.5 million total subscriptions as noted here, "Chinese WOW Players Speak Out," Eurogamer Available at: http://www.eurogamer.net/article.php?article_id=62500, Last checked March 19, 2006, Chinese players have their own server – though admittedly many choose to play on US servers because they feel that they are better maintained.

15. This is a connection that is often made when players either in-game or on the forums have demonstrably poor English (i.e., "You sound like a Chinese farmer").

16. Michael Erard, "The Madarin Offensive: Inside Beijing's global campaign to make Chinese the number one language in the world," Wired, (April 2006), 84-93. This article is an example of the tenor of the trend to cast China as the new "demonic other" with which America must compete to maintain its world cultural supremacy. Almost any news story or op-ed piece from an American newspaper, magazine, or news show would have sufficed.

17. In general chat on the server Balnazaar one player referred to another player as a "nigger." Many responses to this comment followed immediately pointing out that such racially charged language is offensive – a response by one player that was representative of many of the comments was, "You fucking piece of racist shit."

18. IGE Available at: http://www.ige.com/, Last checked March 19, 2006. An MMOG gold clearing house that buys gold from the sweatshops and then sells to gamers.

19. James Lee, "Wages Slaves: From Sweatshops to Stateside Corporations, Some People are Profiting off of MMO Gold," 1Up Available at: http://www.1up.com/do/feature?cId=3141815, Last checked March 19, 2006; David Barboza, 2006.

20. The editor of PC Gamer magazine has nothing but vituperation for "gold farmers" – echoing the popular opinion of many in the online gamer community.

21. I will not bother arguing the point that the gold farmers deserve the ill treatment at the hands of the online gamer community. Personally, however, I do not disapprove of their actions as this is simply a game for me while it is the livelihood of those working in the sweatshops. There is a large thread of hypocrisy running through the gamer community and the stance they take on this issue – the gold farming industry would not exist if there was not a market.

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Gareth Schott

Documenting Digital Life: Invoking Everyday Life Accounts from World of Warcraft[1]

The popular MMORPG *World of Warcraft* (2004) contains a total worldwide population over 8.5 million players and growing. Accounting for socio-cultural practices of its large populace is a diverse and fascinating array of documentation methods produced by its players in an attempt to articulate the contours of everyday life experiences within its game world. This chapter discusses the analytical and interpretive media tools that players' choose to exploit when recording the spaces and incidents inside *World of Warcraft* (*WoW*). It is suggested that examples of player documentation practices drawn from *WoW* evoke the more conscious efforts of the British Mass Observation movement that sought to facilitate the creation of an 'anthropology of ourselves', reflecting day-to-day social activity that forms the fabric of socio-cultural production. The increasing significance of the time and the investment placed in belonging to, and participating in, online communities such as *WoW* are becoming evermore evident by the volume of archival practices executed at both the individual and group (guild) level. Such practices are thus considered in an attempt to gain a different insight into what it means to be users and inhabitants of a virtual space that have been constructed and structured by its developers as designed experiences.

It was during the 1930s that the social research organization Mass Observation was set in motion by Tom Harrisson, a self-styled anthropologist, Charles Madge, a poet and journalist and Humphrey Jennings, a documentary film-maker. As part of its agenda members of the public were invited to record their day-to-day lives as a means of understanding civilian life during wartime Britain. The study of 'everyday life' is therefore a desire to understand the nature and role of the routine, the ordinary, and ultimately previously overlooked aspects of human existence that might mistakenly suggest the mundane and quotidian. Yet, it is only by attending to the everyday that we gain access to sites where, in this case, new media technologies are being negotiated and played out as 'lived' daily experiences (Lister *et al.*, 2003). When applied to the fluid and constructive spaces of MMOGs, it is possible to examine how such spaces transform and become the very nature of everyday practice for its players. Irrespective of the commercial presence of

1 I'd like to acknowledge the input of Sean Castle and Euan Kilgour who provided great guides for this cyber-flâneur's journey through WoW community spaces.

videogame texts, associated everyday social and creative practices of game cultures remain, for most part, clandestine. Thus, this account of the way players inhabit MMOG spaces is guided by an interest in the hidden social narratives that course beneath its more mainstream cultural discourses. What we find is a culture that consistently creates a participatory/performance network that transgresses the gap between consumption and production through its appropriation, active negotiation and reconfiguration of its social and material resources (de Certeau, 1984).

The tactics and subversions of players that subsist in a MMORPG like *WoW* are obviously conspicuous and distinct from everyday life practices in its non-virtual counterpart, as game players develop alternative world perspectives with regard to the conditions of existence (e.g. avatar mortality, accumulation of wealth and the nature of subsistence). In entering into this world, it would appear then that players agree to the logic of the game world and the conditions of conflict that divides it, determining players' behaviors and interactions. However, the distance between player and screen-mediated objects of fascination are often transgressed by a series of complex connections and relationships between both worlds that, on the one hand, involves an acceptance of the presentational truth on offer within the game (van Leeuwen, 1999), but on the other hand requires players to assume responsibility for the interactive unfolding of plot involving "simple conflicts of survival, prosperity and progress" (Lindley, 2002, p. 206) that are determined and informed by external experiences.

While the scholastic practice connected to the discipline building of Game Studies remains in its infancy, a fast track to theoretical authenticity is often achieved through the extension and application of well-founded theoretical frameworks that (often separately) address the various modalities of digital games as interactive media. In doing so, there remains a need to guard against theorisation becoming too divorced from specific practices and artefacts from the medium and its surrounding culture. While this chapter seeks to explicate player documentation and archival practices as an articulation of the meaning and value attributed to gaming knowledge and experience, it also seeks to reinforce the valuable nature of attending to various examples of referentiality grounded in fidelity to the 'meaning' of everyday life in a digital domain such as *WoW*. The examples outlined in subsequent pages therefore intend to demonstrate the wide range of narrative, dramatic and/or imaginative devices employed to articulate the diverse approaches to engaging with and reflecting upon the particular game spaces of *WoW*.

The capture of real time in-game footage and its dissemination (via digital archival tools such as Google Video, You Tube or warcraftmovies.com) is one form of player practice that constitutes an equivalent to more traditional approaches of recording the conditions of the physical real by camera or microphone. While such footage often serves as a celebration of players' performance and mastery of the prescribed experiences of the game and their grasp of its virtual ecology, expository accuracy is embedded within the artifice of a narrative construction. An excellent example of this, from many hundreds

that are available to choose from, is 'Firemaw: A Blackwing Lair Educational Film' (Rabbit Slayer Production), a 'master class' or 'how to' guide that mimics the black and white celluloid instructional films of the 1950s and 60s, replete with the vertical lines of damaged film stock and the sound of a whirring cinema projector. Once Louis Armstrong's 'A Kiss to Build a Dream On' fades, a smooth ubiquitous voice over narrative, much like presenter Troy McClure of *The Simpsons* educational video parodies (e.g. 'Zinc Oxide and You'), begins in earnest: 'You've read all the strategy and seen all the films. But what have you actually learnt from the films? Not much, except that people like to listen to heavy metal and techno?' The narrative provides a reference to the hours of evidential in-game footage available on the web that requires high levels of interpretive work or experiential knowledge to understand its content. Once the film sets itself apart from existing films, it proceeds to outline a strategy for 'dropping' Firemaw (a fictional dragon within WoW) in great detail through annotating footage of a successful mission (including contingencies) over its five and a half minutes running time. Such work reveres the conditions of game-play in a way that illustrates how the boarders between ludic and representational motivations are neither distinct nor firm. While the 'instructional address' of the film is prompted by the desire of a citizen of *WoW* to drop Firemaw, its articulation is expressed in terms of the exploitation and manipulation of the game system. Yet, in a digital domain so prone to modification and subversion, we are presented with what can best be described as the communication of 'truths,' due to its status as a referential record and the potency of the moving image footage that was captured. Thus, in 'Firemaw: A Blackwing Lair Educational Film' we possess a good example of creative authoring around an actuality which is both revelatory and 'deep-seeing' in relation to the mastery of the practices of play.

Player creative practices (e.g. machinima) inspired by virtual domains such as *WoW* also frequently confront and challenge the well-defined cultural field of the game world itself, that in this instance utilises the popular folkloric landscape popularised by the literature of J.R.R. Tolkien. The MMORPG version of *WoW* occurs on Azeroth, a planet containing a characteristically Earth-like geography inhabited by a diverse, yet familiar array of species (Humans, Orcs, Dwarves, Trolls, Gnomes, Elves). Forms of player documentation and creative practice exist that illustrate what other facets of the 'lived' experiences players' bring to the game world. Accounts that often sees *WoW*'s characters used against the grain as players embellish and cut through the distinctive traits, intrinsic qualities and moral fiber of their adopted personas.

An excellent example of destabilizing, not only the out of this world nature of the game space, but also the disposition of its characters is the machinima work 'The Internet is for Porn.' The producers, understood to be Evilhoof and Flayed of Argent Dawn (EU), cleverly exploit the game's emoticons to sync Horde performances with a song (of the same title) taken from a Broadway comedy musical *Avenue Q* that features a Muppet parody of the *Friends* situation comedy revolving around the everyday lives of neighbors in New York City. The musical itself challenges political correctness with songs like 'Eve-

ryone's A Little Bit Racist' and 'I'm Not Wearing Underwear Today.' Indeed, the song adopted for the *WoW* machinima features Avenue Q's internet addict character, Trekkie Monster, and his challenge to the intellectual and social function of the internet, as espoused by the innocent kindergarten teaching assistant Kate. The musical therefore exploits the asexual and innocent nature of children entertainment puppets of the kind seen in *The Muppets* and *Sesame Street*, instead giving them adult concerns and desires. In an act of performance and production, the machinima serves to append this parody even further by presenting game avatars, themselves products of the internet, as users of a hypertextual domain (either by proxy as agents of players, or within the context of their own reality) who view and gain pleasure from pornographic material. The work not only implies a reference to the older demographic of MMORPG players but also the position of the game as a co-constituent of a miscellaneous online existence. In doing so, *WoW's* avatars are been inscribed with an organic quality linked to human practices which also underlines how the game both subverts 'society at large' of the present, through its simulation of a world history devoid of industrialization yet constructed in the medium of electronic age technologies.

More broadly, game-titles that have yet to receive cross-media convergence in the form of a high profile Hollywood adaptation (although WoW the movie is believed to be in the pipe-line), will attain fan-generated cross-modal representation through the remediation of game content within other complimentary media such as machinima. Such practices serve to further integrate the distinctive aesthetic and possibilities offered by game worlds with other media, an increasingly popular strategy also adopted amongst more mainstream narratives such as the hypertext, artificial-reality inspired *The Matrix* whose narrative was transversely played out simultaneously across live-action, animation and games formats. This reinforces the complex relationship between organic (human) and inorganic (culture) that, in part, provides the critical mass of imagination that enables production to be 'radical' in the sense of how the everyday is employed or exploited during, and as a consequence of, game-play. The affordances connected to different representational media are therefore regularly being utilised by players to offer its community different entry points and experiential engagement with the same narrative form.

Player creative practices suggest the significance usually given to an 'authoritative original' or 'primary' text by cultural and media studies appears to be eroding and giving way to what Aumont (1997) has referred to as "stratified time in which we move through different levels simultaneously, present, past(s), future(s)" (pp. 129-130). For players, time surrounding this popular media artefact is collapsing allowing its different elements and treatments to casually co-exist. Indeed, a spatial conception of the networks of representations connected to a particular game such as *WoW* would only serve to undermine the fluidity of the processes of connection and disconnection that operate, not only between real and virtual domains, but also in and around the different depictions of its universe and characters across different media. Within creative practice such as player-created machinima it is possible to

locate the presence of multiple interpretations of race-based identities and motivations that do not imply a convergent stability or an end-point of unification, but the normal state of a continual *process* where moments of convergence are matched by equal moments of divergence.

OFFERING A 'LIVED' EXPERIENCE

The underlying premise of *WoW* (like other MMORPGs) is the offer of a prolonged existence within a recognizable mythological world, distinct from reliving more structured narratives, such as the *Lord of the Rings* videogame *Lord of the Rings: The Two Towers* (2002). In contrast, such games employ a logic of play with far less adaptive qualities or permeable boundaries that reflects the way Tolkien's tale privileges the protagonists that form the 'fellowship,' that at the same time, represent the more worthy races of Middle Earth. An obvious exception to the dichotomy vastly separating good from evil within Lord of the Rings however is the character of Gollum whose transformation from Sméagol serves as a cautionary tale of what could happen to Frodo should he allow the power of the ring to consume him. Gollum is therefore imbued with an ambiguity indicative of the complex combination of good and evil that resides within him, setting him apart from other characters that are usually completely good or wholly evil. In contrast, all players of *WoW* have the option to 'become' one of eight battle-worn races that inhabit Azeroth, including Orcs whose journey from Draenor reveals a more complex, savage and brutal past. Distinct from the presentation of Orcs in *Lord of the Rings*, the Orcs of *WoW* have reclaimed honor, no longer pawns of the Burning Legion in a fight for conquest, as they fight instead for their right to survive in their adopted world. On the surface, pre-prescribed 'masks of identity' are presented for role play, yet quickly attain a more complex multi-layered reality.

The choice of races open to players sets them free from witnessing/performing the three-act structure of a hero's journey (Vogler, 1992). Instead an MMORPG offers players an everyday experience closer to what Tom Stoppard (1964) achieved in his play *Rosencrantz* and *Guildenstern Are Dead*, in which he retells the story of Shakespeare's *Hamlet* by centralizing the untold journey of two of the play's more marginal and insignificant characters. In the Shakespeare play, Rosencrantz and Guildenstern function as simple plot devices. As childhood friends of Hamlet, Rosencrantz and Guildenstern are summoned by King Claudius to inform on Hamlet's bizarre behavior, in doing so they become unwitting accessories in the plot to execute Hamlet as they escort him to England and his death. However, in foiling the King's plot Hamlet engineers the executions of Rosencrantz and Guildenstern. The audience only learns of their deaths when it is reported incidentally after Hamlet return to Denmark. In Stoppard's play, Rosencrantz and Guildenstern become the major characters while the *Hamlet* figures become plot devices.

Another comparison can be drawn between the pleasures on offer within the WoW universe and the work of children's graphic novelist Raymond Briggs who is responsible for tales such as *Fungus the Bogeyman* (1977) and *Father*

Christmas (1973). In *Fungus the Bogeyman*, Briggs' was able to unite the folkloric 'bogeyman,' conjured to frighten children, with the childish humor associated with the word 'bogey' (meaning mucus), to produce an account of the mundane conditions of everyday life and the universe that his character Fungus inhabits. Bogeydom became a place to enjoy the inverse of that which humans take pleasure in. Indeed, Fungus and his family keep their house dirty, scent their air with stink and enjoy slimy and spoiled food. Almost each panel of the graphic novel is satiated with information on Bogey habits, myths, hobbies and culture. The MMORPG of *WoW* offers players similar pleasures, as they are able to occupy territories of the mythical, converting the unreal and fantastical into a lived reality in which they assume responsibility for constructing and maintaining the social culture of Azeroth. Indeed, in line with the sub-cultures of 'fan' communities (see Brooker's, 2002, account of *Star Wars* fans) MMORPG communities produce a broad range of practices that attempt to conceptualise and articulate 'everyday life,' including the more traditional composition of fan-fiction and creation of fan-art, that are rooted in a desire to further develop fictional worlds and deepen accounts of player/guild motivation and game ecology (see Schott & Burn, 2004; McGeady & Schott, in press, for examples of fandom practice directly spurred by console game texts).

ARTICULATING A SECOND LIFE

In addition to the game structures within which players operate and duly transform through their own play practices and social commentaries, the documentary practices of players are also indicative of the need to acknowledge the transformative and fluid quality of our saturated selves (Gergen, 1991) permitting virtual personification to constitute a key aspect of the ecology of an individuals life. The complexity of human mediation of the inner and the outer experiences of the self was articulated by, philosopher and founding father of psychology, William James (1890) as:

> the sum total of all he can call his, not only his body and his psychic powers, but his clothes and his house, his wife and children, his ancestors and friends, his reputation and works, his land and horses, his yacht and bank-account (pp. 279-280).

Thus, it makes sense to find amongst the practices of recording key moments that punctuate our lives, such as birthdays, anniversaries or holidays, players of MMOGs adding events from virtual living, such as screen captures of levelling up (see Fig. 1) or online wedding ceremonies within *WoW* (Yee, 2006). Such practices demonstrate how the self can be understood as a constructive entity adaptable across different spheres of subsistence[2]. In charting the increased relevance of time spent occupying the virtual, players' are found utilising multiple media channels in order to articulate the pleasures of their

2 The concept guiding the online virtual spaces of Second Life (Linden Lab) embodies this exact notion of inhabiting a legitimate and fulfilling virtual life.

shared practice, demonstrate their heightened levels of appreciation and also enunciate and define their wider 'tastes,' thus often transforming the intended use of the game text to express alternative interests.

Figure 1. Screen capture of levelling up submitted to Nick Yee (2006)

While the post-modern conception of a fragmented multiple self is a useful concept for understanding how virtual subsistence has achieved legitimacy and authenticity as part of players everyday lives, it does not exclude the collision of those separate selves. Indeed, one case example demonstrates exactly how players of *WoW* do not necessarily share and celebrate all forms of subversion equally. When the life of a *WoW* player ended, the subsequent attempt by their guild to facilitate an e-funeral raised questions concerning the 'discrete' nature of its world ethics and morals. Controversy was caused by guild 'Serenity Now' (Illidan, US) who, upon learning that the funeral would be an unarmed event, crashed the funeral killing its attendees. The guild also produced a document of this *WoW* event, entitled 'So We Pwned a Funeral Today: Serenity-Now.org' that incorporates a forum backlash as context in its introduction prior to the game footage. Comments include: 'congratulations you have stooped lower than any other guild in MMO history,' and 'I hope Azshira's dad dies of a heart attack, then at the funeral some guy runs in naked and pushes the coffin over and runs around slapping people screaming LOL OWNED, then releases a video of it.' The footage shows an orderly funeral procession (accompanied by Mozart's Requiem), cut with footage of the attackers journey to the funeral (accompanied by The Misfits' Where Eagles Dare), before the attackers arrive

and disrupt the solemn proceedings. Forum debates centred on the ethics of the action, based on a clash between its symbolism and significance to a real-world event against the logic of a Player verse Player server where the event took place. One commentator summarises the dilemma as: 'to be honest the whole point of PVP servers is that you can kill other PCs. I agree it's sick, but at the same time walking around unarmed in the one type of environment where you can be killed is kind of dumb' (Godeskian, 2006).

The Construction of Cartographic Accounts

In an age of ubiquitous creativity, player documentation and production practices reflect the catalytic nature of the game developers' innovation as well as an ethnographic articulation of a new sense of spatial (dis)order within these new cultural domains. Thus, the quotidian practices of players utilising different media production tools, not only articulate and embody the social experience within the *WoW* gamescape, but also form a dialogue between ethnography, culture and space. An interesting example can be found in players' disseminated written and illustrated accounts of journeys into 'dead zones', uncharted regions, within *WoW*. Player Tony Walsh (2005) provides one such account in which he describes the destination of his expedition as:

> Unlike the rest of World of Warcraft, the area was devoid of detail, save for unusual terraforming. No creatures or buildings dotted the basin-like landscape, which, as far as I could tell, was due north of the Eastern Plaugelands

Having shared this account, other players offered similar accounts of forays into the wilds of *WoW*. For example: 'There is another kind of dead zone if you swim east of Arathi Highlands there are houses and npcs but all the npcs act as if you were in Dun Morogh and give you instructions how to get to the fightmaster etc.' Unlike maze navigation, that involves conditional progression towards a single exit point, the rhizomatic environment of *WoW* (Deleuze & Guattari, 1988; Murray, 2000) possesses distinct kinds of 'desirable directions' that offer different kinds of pleasures. In this case, it is not mission resolution or the type of experience that constitutes a 'strategic indexed commodity' (Carr *et al.*, 2006) but the delight in penetrating the hard boundaries of *WoW*'s gamescape (King & Krzywinska, 2003).

A different yet interesting example is provided by a celebrated act of player subversion that tested to boundaries of *WoW*'s territories, this time captured as game-play footage. The subversion was made possible by a Horde guild that in engaging outdoor-raid encounter Lord Kazzak were able to 'kite' him (to maintain a distance, usually out of 'melee' distance but within 'ranged attack' in order to lure the pursuer) into the center of Stormwind, the capital city of the humans of the Alliance. Captured in 'Kazzak Does Stormwind,' we see footage of Kazzak destroying everything in his path during his hour and a half rampage before a Game Master (Blizzard employees that monitor servers and possess problem solving and discipline powers) returned Kazzak to the Blasted

Lands. What is interesting about this event is Blizzard's reversal of the disruption and breach of its spatial logic by resetting the server and performing a rollback. Indeed Kazzak now remains bound in chains as a result of his little adventure to avoid a repeat of this event. Here player agency is undermined and the limitations of their ability to respond to further attacks, by fortifying Stormwind or creating a blockade, is exposed.

Reflecting on Paul Marino's (2004) definition of machinima as 'animated filmmaking within a real-time virtual 3D environment' (p.1) for a brief moment, his words suggest the importance of what it means to engage with virtual spaces and how the process of play then shapes what occurs when the virtual becomes actualised in a single animated film at any one time. The definition of this one form of player communication and documentation practice implies the multiplicity of choices potentially generated through interaction within a virtual environment that become *contained* and selected as a singular and repeatable trajectory of actual choices by the producer as a final outcome. Using Cubitt (1998) as platform, Shields (2003) states that virtual environments are characterised by four elements including:

- The primacy of navigation and movement;
- Smoothness or unity of the digital environment, which includes a computer-generated character or avatar representing the user;
- A single 'point of view' which represents the user's position and outlook onto the VE;
- [and] implied off-screen spaces (pp. 60-61)

These elements are utilised by players as documentarians in a process that sees the openness of choice, connected to spatial practices within *WoW*'s game space, displaced by a map of *particular choices* channelled into a film. An understanding of these products therefore suggests a need to examine the spatial practices involved in the process of its production.

The production of player films can therefore be viewed as a cartographic practice, that is a mapping of particular actions that trace out particular desires including those of narrative, technical prowess and the expressions of pleasure (thus a cartography of experience as much as of space). This perspective is useful as it continues to acknowledge the importance of the spatial but also establishes the notion that player production is a registration of particular performances symptomatic of the desires that are shaped by the conditions of game experience and the investment in particular cultural practices. Player footage, therefore maps the cultural practices of game players as expressions of their experiences and pleasures. Furthermore, there is an exchange of these maps in relation to other players/viewers within gaming communities, an exchange that suggests particular readings and interactions with these maps allowing an appreciation of shared knowledge, pleasures, as well as the display of skills which signal the conditions of production implied by the mapping process.

The phenomenon and cultural icon of *Pals for Life* member Leeroy Jenkins arose due to the viral distribution and community-level acknowledgement of the significance and humour behind events captured and presented as real-

time game footage. The audio-visual clip, 'Leeroy', reinforces the duality so often negotiated in documentary work between artifice and evidence, as it offers a self-conscious styling and dramatised re-construction as a result of the exertion of considerable authorial depictive control. In this document we witness a mission in the Rookery Room at Upper Black Rock Spire that goes horribly awry as a Tank returns from being 'away from keyboard' (see fig. 2), ignores all agreed strategy and recklessly rushes into the Rookery shouting his (now frequently impersonated) battle-cry 'Leeeeeroy Jenkins.' This results in the carnage of his slaughtered guild members onscreen leaving only their *TeamSpeak* reactions; 'God damn it Leeroy', 'Leeroy you moron!' and 'Leeroy you were just stupid as Hell.' The film's popularity is evidenced by the communities response in the form of a web-page featuring a dance-remix track containing the *TeamSpeak* audio (leeroykombat.ytmnd.com/), low content fan-sites (e.g. http://www.leeroyjenkins.net/) as well various apparel for sale and a citation on the US television quiz show Jeopardy in the question 'This role playing game out in 2004 returns to the "world" of Azeroth were heroes like Leeroy Jenkins do battle?'. The film has also had an impact on the broader game world with the game *Guild Wars* (2006) pun Kilroy Stonekin, a quest with the objective of staying alive while the dwarf Kilroy rushes off in a berserk rage shouting, (you've guessed it), Kiiiiillllllrooooy Stoooonekiiiin! As Lowood (2005) argues in his account of the film: 'As a performance, "Leeroy Jenkins" comments on a moment – death by incompetent playing partner – experienced by players of almost any multiplayer game.' In doing so, he argues, the film occupies 'liminal space between documented gameplay and fictional performance' (p.6). Thus, in agreement with Lowood, the question of the films authenticity, as a non-staged event, is rendered meaningless in light of universality of what it depicts which is an insight into the shared culture of player experiences.

More fluid accounts of *WoW* are offered on the Metroblogging site for Azeroth, which sees *WoW* receive equal status with 50 active sites offering city-specific blogs from San Francisco, Bangkok, Karachi to Rio de Janeiro. The generic aim of the site is to give readers access to the viewpoints of 'regionally' embedded bloggers to provide 'a new perspective on daily life.' The Azeroth metroblogging site offers precisely that entry point into the 'lived' experience of *WoW*, as this entry illustrates: 'the reason that I spend so much time playing, is the immersiveness that the game environment offers. I've watched sunsets and sunrises, I take screenshots like a tourist snapping pics, I've stood in Stormwind watching the fireworks, saying "Ooh" and "Aaah" along with everyone else...just as you would in real life.' An even more inventive practice that extends the blog concept further, was the performance of a live blog during game-play. Reported online at clickableculture.com, the live blogger documented a dungeon crawl in Blackwing Lair. While absent guild members are typically able to follow similar social activities, when not able to participate directly, via the MMORPGs group text-based communication channels pre and post events, the live blog provided insight into the individual's phenomenological experience of the game as it was being played out.

Figure 2. Leeroy, positioned on the far left in AFK mode prior to his charge.

A more extreme example of game-play commentary is guild leader First Sergeant Dives' (Wipe Club) abusive and obscenity-laden *TeamSpeak* audio that has became infamous amongst the *WoW* gaming community. So much so, it has seen Dives' receive the accolade of 'this year's Leeroy Jenkins'. Put to use during high-level raids against *WoW*'s most difficult opponents in order to coordinate a large number of different classes working together, *TeamSpeak* audio is becoming an increasingly popular and exchanged mode of player-created content. Furthermore, in Dives' miss-management of a pass at *WoW*'s dragon-boss Onyxia we find another illustration of social practice that offers a counterpoint to the fantasy setting of *WoW*. While Onyxia is a typically difficult multi-phase fight that is laden with many obstacles that can consume many hours in failed attempts, the audio (which has since been given an accompanying flash animation for dissemination by Delouthor) captures the degree of Dives' frustration, illustrating how emotional and socially meaningful such events are within these domains. As the following extract demonstrates:

> OK listen the fuck up. You are going to DPS very, very slowly ['damage per second' being inflicted by raiders that also determines 'aggro,' the degree of response aimed back at the raiders]. Now ... and by slowly I mean FUCKING slow. If you get aggro, it means you're going to lose 50 DKP because you didn't know what the fuck to do ['dragon kill points,' an MMOG system for deciding who gets loot after killing a big boss dragon that is based on greater reword for greater participation] And watch the FUCKING tail …

> Who the fuck was that? Crushim, what the fuck? Whelps, left side! [a reference to whelp eggs that, should a player get too close to them, will break open and produce tiny attacking dragons] Even side! Many whelps! Now, handle it! Fuck! That's a fucking 50dkp minus! What the fuck was that shit? If you stand in the right fucking place, there is no way you are going to fucking get into the goddamn whelps, whatever fucking fear, tailswipe, whatever the fuck, ok? It's like one in a fucking million. From the fucking north corner to the middle into the fucking whelp cave, it's not even fucking remotely imaginable!

Dives' (or 'that 50 dkp minus guy') contribution, together with other examples provided in this chapter, become widely regarded within the game community for the distinct personal manner in which they address and respond to the procedural demands of the game system. In such examples the representational system and the game system pull apart during individual expression of a culturally and locally specific transformation of the demand structures of the game system.

CONCLUSION

In Fiske's (1992) account of fans, as those who engage in a broader range of 'producerly activity' than conventional audiences, we find a more faithful prediction of the rise of digital subcultures characterised by a 'consciousness of difference' (Hebdige, 1997) with regard to the nature of production, ownership, agency and authorship. A consciousness that very quickly led to subversions of game software not only producing alternative uses and accounts of occupied spaces, but a treatment of game texts by players as objects that are not just revered for what they are but what they enable. Understanding player documentation practices as displays of interest, affection and attachment so often associated with the practices of fandom, is not adequately rationalized or understood in the same way as a 'passive response' to objects of obsession. Instead such works outlined in this chapter call for a reversal of the treatment of those who invest in texts of popular culture from consumers to producers (Jenkins, 1992). In doing so, the practices of *WoW* players articulate a reality that is otherwise not readily available for scrutiny, invoking 'their' ordinary culture and making the invisible visible.

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Julian Kücklich

Set DeusEx.JCDentonMale bCheatsEnabled True: Cheating as a Way to Enhance Player Experience in Deus Ex

INTRODUCTION

Everybody who plays video games knows how widespread the practice of 'cheating' is. You read about it in video game magazines, in fan forums, and on websites like *IGN* or *Moby Games*. Game shops try to sell you glossy game guides and dedicated cheating hardware along with the games. You can't even search for information on a game on Google without being offered cheat codes, frequently even within the first ten hits. Despite the fact that we don't have any reliable statistical data about the prevalence of cheating, it seems obvious that cheating is an integral part of gaming culture.

We know, however, that the providers of online games spend considerable amounts of money on the prevention of cheating. Quoting game designer Ralph Koster, Katie Salen and Eric Zimmerman (2004) estimate that "tracking down cheaters and hackers can occupy approximately half of all the resources spent on maintaining and improving an online game" (p. 280). And we know that cheating generates enough revenue to make it a profitable business for publishing houses like Brady Games and Prima. *GameFAQs*, one of the most renowned cheating websites, is visited by "900,000 unique gamers […] each day", according to its owner, CNET Networks (2006).

However, there is hardly any research on the practice of cheating in video games,[1] although even game researchers admit that they cheat when they are playing for research purposes. A survey among game researchers that I conducted in May 2006 found that 48 percent of the respondents consult game guides or walkthroughs regularly, and only 33 percent never use cheat codes to increase health or resources. Cheating seems to be one of those things that everybody does, and nobody talks about. In this chapter I argue that we need to start talking about cheating if we want to understand the range of experiences that video games have to offer.

At this point it should be pointed out that this chapter emerges out of a larger body of work, which studies cheating from a theoretical point of view.

1 It should be pointed out that this has begun to change, primarily because of Mia Consalvo's work on cheating (see Consalvo, 2005a, 2005b, 2007).

The perspective I assume therein is that of a critical observer of the school of game studies which has become known as ludology (see Aarseth *et al.*, 2003; Frasca, 2003; Juul, 2005), and which assumes the primacy of rules over other game elements, leading to a formal approach to the analysis of games. By contrast, my own approach could be described as *de*ludological, i.e. an approach that assumes that breaking the rules is primary, while the rules themselves are secondary – as paradoxical as this may sound. I think this perspective is a necessary complement to that of ludology, and this is the reason that I emphasise the breakability of rules throughout this chapter.

The practice of cheating in single-player games is especially interesting in this context, because it allows us to study the practice of 'manipulative play' outside of the moral context that the term 'cheating' suggests. Instead, it enables us to approach cheating as an aesthetic phenomenon. Rune Klevjer has pointed out that "the gaming experience […] characteristically is an aesthetics of control." An aesthetics of digital games must therefore take into account the 'illegal' modes of enhancing or diminishing the player's control. Similar to the way video recorders have changed the experience of watching films by giving the viewer more control over the viewing process, cheats can radically alter the experience of playing a game.

Part of the problem in talking about the practice of cheating is that we do not have a terminology for the various practices of cheating yet. It isn't even entirely clear what should be considered cheating, and what is simply an extension of gameplay. Consider walkthroughs, which supply players with step-by-step instructions on how to progress in a game. A typical walkthrough may tell a player how to solve a puzzle, how to defeat a 'boss', or how to find her way through a maze. Clearly, this gives the player an advantage that players without access to a walkthrough don't have.

In this chapter I will use an extensive definition of cheating for heuristic purposes, i.e. a definition which includes all the practices which are considered cheating by players themselves, although of course not by all players. This definition includes walkthroughs, game guides, FAQs, cheat codes, as well as hardware- and software-based cheating devices. In other words, I am including everything that the most orthodox group of players defines as cheating, as described in Jeff Yan and Brian Randell's (2005) attempt to devise a classification system for cheats (also see Consalvo, 2005a).

In the popular discourse about cheating, those that do not condone these practices often make reference to the game designer's intention. A case in point is an article by Jeremiah Kaufman (2000) on *adventurecollective.com*, in which he asserts that "the creators of the game [*Maniac Mansion*] have put a lot of time and effort into the puzzles and want people to enjoy discovering the solutions, not race through the creation with a hint book in left hand and a mouse in the right hand (or vice versa)." It would be easy to dismiss this as a case of falling prey to the Intentional Fallacy (Wimsatt & Beardsley, 1946), but Kaufman actually makes an important point by raising the issue of replayability. As he points out:

> Adventure games are a special breed of game, in that figuring them out is most of the fun. In a game of another genre such as Quake, for example, a person can easily cheat to see the end, but afterwards that person can play the game from beginning to end without cheating, accepting the challenge that the game creates. That, however, is impossible with an adventure game. Once the only puzzles which belong to an adventure game are part of your physical memory there is no way to forget them. In other words, the game is ruined beyond repair.

Hence, one of the first differentiations we have to make when we talk about cheating is between different kinds of obstacles that cheats can help the player in overcoming. A puzzle that requires the player to combine certain items in a particular way, a type common in adventure games such as *Maniac Mansion* (1987), is indeed 'ruined' once the player knows the solution. An action game such as *Quake* (1996), on the other hand, will not cease to be challenging because the player uses a cheat code that makes her invincible or supplies her with unlimited ammunition. This is because the 'solution' to the kind of obstacles that a game like *Quake* confronts the player with, is not based on knowledge but on skill.

Whether using walkthroughs is considered cheating or not may thus be dependent on the game genre, and the intensity of use. Playing an adventure game like *Maniac Mansion* 'with a hint book in left hand and a mouse in the right hand' would entirely defeat the purpose of the game, and may be considered a form of cheating. In action games such as *Quake*, the actual challenge lies in overcoming the opponents the game pits against the player, so the use of a walkthrough may be considered legitimate. This attitude is summed up by South African game blogger Rooi Willie (2006) when he writes: "there's a time to use cheats or walkthroughs, and a time not to" (also see Yan & Randell, 2005).

This draws attention to the fact that there are no hard and fast rules about what constitutes cheating and what doesn't. Rather, cheating is socially constructed in the discourses about games. This is also true for the academic discourse about games. Consider the following statement by Espen Aarseth (2003):

> While it is understandable that academics with not too much time on their hands find it difficult to spend the hundreds of hours necessary to master a game, and therefore give in to the temptation to zip through a game [...] using the walkthrough, or (even worse) using the no-clipping or god-mode cheats, it is hard to imagine excellence of research arising from such practices. Where is the respect for the game? And, more importantly, how is the flavor of the game kept intact?

This moralistic statement betrays a naïve belief in the game designer as a romantic author with absolute control over her creation, which is remarkably similar to the way the designer's intention is used as a point of reference in the popular discourse about games. Of course an important part of socialisation

through games consists of the inculcation of cultural values of fairness, and for that reason nobody can be blamed for feeling that cheating is somehow inherently wrong, even when it takes place largely outside the social arena, as is the case with single-player games.

However, this attitude makes it hard to make sense of a fascinating aspect of gaming culture, and it taints even practices that are called cheating but do not actually tamper with the rules of games. For example, in Germany, graphic depiction of violence is usually removed from foreign games prior to their publication in order to appease the rating board, but the gore can be restored by changing the game's locale settings.[2] In a similar way, many cheats for games like *Grand Theft Auto III* (2001) simply modify certain parameters of the game world, turning pedestrians into berserkers, or cars into flying machines.

In fact, cheats seem to have only one thing in common: they change the way players experience the game. They do so either by literally changing the look and feel of the game environment and the objects therein, or by increasing the strength and abilities of the players' avatars. A working definition of cheats should therefore be based on their ability to change a player's perception of the game-world, rather than their manipulative or even destructive qualities. Such a definition serves not only as a safeguard for a value-neutral assessment of the subject at hand, but also enables us to distinguish different types of cheats by the ways in which they change the players' experience of the game.

In the following section I will use the example of *Deus Ex* (2001) to demonstrate the many different ways in which cheats can change the experience of playing video games. In doing so, I will build on a classification of cheats I have developed elsewhere (Kücklich, 2008), and suggest new ways of approaching cheats theoretically. In the process, I will make use of terminology borrowed from semiotics, systems theory, and literary theory. This transdisciplinary approach will enable us to gain a better understanding of the complex phenomenon that is cheating in single-player games.

CHEATING IN DEUS EX

Deus Ex provides a good example for an inquiry into the nature of cheating in video games because it spans a number of genres and playing styles. Visually, the game is a first-person shooter like *Quake* or *Halo* (2001), and this also informs large parts of the game play. During play, the protagonist, JC Denton, is repeatedly thrown into situations where he must defend himself against attackers, and often the easiest way of doing so is by eliminating them. However, the game usually offers an alternative to the use of brute force, and this often takes the form of using stealth to avoid opponents, similar to the way stealth is used as a game mechanic in games like *Thief* (1998) or *Splinter Cell* (2003).

Additionally, the game incorporates elements of adventure and role-playing games. Similar to adventure games such as *Maniac Mansion*, the game requires the player to solve puzzles from time to time, although they are usually not as hard as those found in actual adventure games. The game also

2 In the jargon of German gamers this is referred to as a 'blood cheat'.

borrows elements from role-playing games like *Baldur's Gate* (1998), allowing the player to customize the protagonist to a certain degree, and to upgrade his abilities at regular intervals. Importantly, the game also requires the player to use the resources supplied by the game – money, health, and bio-power – in an economic fashion, a feature often found in strategy games.

It is also worth pointing out that *Deus Ex* has been published both for the PC and for the Sony PlayStation 2. The latter version, which is often referred to as *Deus Ex: The Conspiracy* (the title of the American re-issue) differs substantially from the PC version, in terms of interface design, map size and graphics. Importantly, the two versions also differ considerably in terms of the type and variety of cheats available. Since consoles are essentially a 'closed' technology, and do not allow players to tamper with game files directly, the number of cheats for console games is usually much smaller. This is also the case in *Deus Ex*. The mode of input for cheat codes is also remarkably different in the two versions. While the PC version relies on the standard input mode of a command line interface, the PlayStation 2 version requires the player to push buttons in a specific sequence to activate a cheat menu that allows the player to choose attributes such as 'full health', 'full energy' or full ammo'.

Generic Cheats

Genre is one of the categories by which we can differentiate cheats, thus the generic heterogeneity of *Deus Ex* should be reflected in the cheats available for the game. As I have pointed out elsewhere (Kücklich, 2001), computer game genres can be mapped onto a triangular matrix, according to their specific levels of narrativity, interactivity, and openness. In this model, the term interactivity refers to the frequency of the players' physical interaction with the game, while openness refers to the range of actions the players can choose from. Thus, a fast-paced action game like *Quake* scores high on interactivity, but has a comparatively low level of openness. This model can serve here as an auxiliary theoretical construction which enables us to discuss game genres in rather simple terms.

Fast-paced action games, including arcade games, first-person shooters, beat-'em-ups and sports simulation games typically have a high level of interactivity, but score rather low on narrativity and openness. 'Action adventures' such as *Tomb Raider* (1996) usually oscillate between fast-paced action sequences, exploration, and non-interactive cut-scenes responsible for narrative progression. Typical cheats for action games increase the games' interactivity by making the players' avatars invulnerable, supplying them with an infinite amount of ammunition, or giving them access to all the available weapons.

In *Deus Ex*, all of these cheats are present. The game features a 'god mode', a standard feature of many first-person shooters that makes the avatar invulnerable to enemy attacks. This cheat has been a staple of the genre since the early 1990s, when it was implemented in the games of id Software such as *Doom* (1993) and *Quake*. Typically it is activated by typing 'god' or 'iamgod' into the console, a command line interface that is either part of the standard interface,

or must be activated by unlocking the game's cheat mode. In *Deus Ex*, this is achieved by pressing 'T' (for 'talk') during the game, and typing the following:

```
Set DeusEx.JCDentonMale bCheatsEnabled True
```

There are some cheats that can be used without activating the cheat mode, a feature that is called, somewhat paradoxically, "non-cheat console cheats" on *GameFAQs*, but the large majority of cheats need to have the cheat mode enabled. It is important to note that both cheat consoles and specific cheat codes are generic features of first-person shooters, and are to a certain degree, part of the genre's definition. It would definitely raise eyebrows among gamers if cheat consoles, and god mode cheats were to be discontinued. For *Deus Ex*, this also allows the game to establish its lineage, as the conventional activation of god mode by typing 'god' into the console links the game to its predecessors.

The standard ammunition and weapon cheats are also present. Typing 'allammo' into the console refills the player's ammunition supply. Any weapon, ammunition type, or item can also be created in any desired quantity by using the 'summon' or 'spawnmass' commands. For example, typing 'spawnmass WeaponAssaultGun 99' creates 99 assault rifles. It is also possible to instantly refill JC Denton's health meter by typing 'allhealth'. Combined, these cheats enable the player to defeat any opponent in the game.

Other classic cheats in *Deus Ex*, which are commonly found in first-person shooters, include invisibility, fly mode, and 'no-clipping' mode, which enables the avatar to walk through walls. Since action games typically require their players to perform rather repetitive tasks, much effort is spent on designing attractive settings (arenas, dungeons, racing courses, etc.) for the actual gameplay. Often, these settings must be 'unlocked' by winning a predetermined number of matches or performing a similar feat. Cheats offer a convenient way to circumvent these arbitrary restrictions.

The next set of cheats is borrowed from role-playing games. Role-playing games combine a comparatively high level of openness with narrative progression. If we regard action, adventure and simulation games as genre prototypes, role-playing games and strategy games can be seen as hybrid genres. Therefore, the types of cheats that can be found in these game genres are often a mixture of the cheats found in genre prototypes. Role-playing game cheats, for example, often give the players access to magical items, or allow them to increase their characters' stats, in addition to walkthroughs and maps that allow for accelerated narrative progression.

As we have already seen that any item can be created in *Deus Ex* by using 'spawnmass', it is no longer necessary to dwell on the availability of 'magical' items. Since the game is not set in a fantasy world, but in a sci-fi setting, there is no magic *per se*, but JC Denton is frequently given so-called 'bio-mods' which can be integrated in the avatar's to, due to his cyborg nature. Bio-mods give the avatar 'magical' powers, such as invisibility, the ability to breathe under water, etc., and the canisters containing the mods can be created just like any other item in the game.

Similar to the 'allhealth' and 'allenergy' commands, there is also an 'allskillpoints' command, which allows the player to boost JC's skills to the maximum, removing the need to pursue the character's development further. This is comparable to typical role-playing game cheats such as 'setlevel' in *The Elder Scrolls III: Morrowind* (2002), which enables the player to set the level of a character. The rather small number of cheats to do with the role-playing elements of the game corresponds to the relative insignificance of these gameplay elements in *Deus Ex*.

In adventure games such as *Monkey Island* (1990), the level of narrativity is significantly higher than in other types of games, while the levels of interactivity and openness are comparatively low. Therefore, most adventure game cheats serve to remove 'narrative obstacles', either by 'foretelling' the game's story (walkthroughs), or by offering instant access to higher levels. Interestingly, 'novelizations' of adventure games such as Chris Ratcliff's *Sam and Max Hit the Road* (1993) can serve as cheating devices, but may have aesthetic value independent of the games themselves.

Deus Ex has inspired a number of fans to write walkthroughs for the game, but walkthroughs differ considerably from genre to genre. The fact that *Deus Ex* is inspired to a certain extent by adventure games is mirrored in the fact that the FAQs for the game often include detailed instructions for solving the game's puzzles. It is taken for granted that the player will possess at least a basic level of first-person shooter skills, which will allow her to deal with the game's opponents, although occasionally a walkthrough will contain warnings like the following: "Be careful; these guys have machine guns AND rockets and strafe meaner than any *Quake* player I know" (Novakouski, 2002).

On the other hand, walkthroughs usually give detailed solutions for even the simplest puzzles, presumably in an attempt to be as exhaustive as possible. A good example is the following instruction from Novakouski's walkthrough for *Deus Ex*: "On the wall to your right (in the water) is a door that when opened reveals a valve that will turn off the steam ahead to your right." It is hardly conceivable that a player that enjoys games like *Deus Ex* will not check the water for hidden doors or objects, but the economy of cheating that walkthroughs are part of dictates that even the minutest details are included.

It is worth noting that the authors of walkthroughs operate within a kind of gift economy, in which the relative value of their products is determined by user votes or a similar system of evaluation. The authors usually do not receive financial remuneration (although websites like mogelpower.de have begun to offer monetary rewards for cheats and walkthroughs), but the gain in symbolic capital achieved by creating a popular walkthrough is considerable. Walkthroughs are usually very austere, created with only ASCII characters and no text formatting or images. The only way of embellishing these documents is therefore to add as much detail about the games as possible, in order to make them stand out.

While this general overview of genre-specific cheats is necessarily an oversimplification, and does not take into account differences within genres, it draws attention to the fact that each genre has a set of prototypical cheats

which are to some degree expected by the game community. In other words, far from contributing to the 'corruption' of games, cheats are part of the definition of game genres. This holds especially true for highly formalized genres such as the first-person shooter, in which a game can be regarded incomplete if it does not feature a certain set of generic cheats such as those for invulnerability or teleportation. As game producer Gordon Walton points out in regard to *The Sims Online:* "If you leave a cheat long enough, it becomes part of the culture of the game" (quoted in Wayner).

Non-Generic Cheats

In addition to the cheats already mentioned, there are a number of cheats for *Deus Ex* that cannot be classified by genre. This is significant insofar as we can understand games, with their strong generic conventions, as composed of a basic structure of genre characteristics, which is complemented by a number of traits that are individual, and make the game stand out in comparison to other games. This can also be understood as a reflection of the way games are produced and distributed.

As Kline *et al*. (2003) point out, games are a high-risk product, and generic formulae can be regarded as a way to control risk, insofar as it is often assumed that consumers will rather stick to the 'tried and true' than to buy an innovative but potentially flawed product. Nevertheless, developers and publishers will have to make sure that the game has a unique selling point (USP) that makes it easy for customers to differentiate the game from competitors' products. All of this is achieved by producing games that are generically conservative, but innovative in the way they handle elements such as graphics or sound. This '80-20 rule' seems to be reflected in a game's cheats as well.

Self-referentiality

One interesting way how cheats can transcend generic conventions is self-referentiality. From the list of cheats for *Deus Ex*, one stands out specifically in this respect: by typing 'iamwarren', the player can activate an electro-magnetic pulse (EMP) field that will deactivate enemy robots trying to attack to the player's avatar. The way this cheat is activated is significant insofar as Warren is the first name of one of the lead designers of *Deus Ex*, Warren Spector.

The cheat thus functions as a way of establishing auctorial authority, but at the same time it is a complex signifier of self-aggrandization and self-mockery. Clearly, 'iamwarren' echoes 'iamgod', one of the traditional formulas for invoking the god mode in first-person shooter games, and this is consistent with Spector's power over the world of *Deus Ex*.[3] At the same time, this power is put under erasure by the very cheat with which it is evoked, because it makes

3 This conjecture is not as far-fetched as it may sound. A hidden "Behind the Curtains" menu in Deus Ex allows the player to read quotes from team members, which were collected during the production of the game. A quote ascribed to Warren [Spector] reads: "Poof! I am God."

obvious that anyone can assume this power, by assuming the name of the game's creator.

This seems especially apposite in the case of *Deus Ex*, because Spector has repeatedly expressed his delight that players have found ways of playing the game in ways which were not intended by its designers. One oft-cited example of this kind of emergent gameplay is 'proximity mine climbing', an in-game practice that allows the avatar to scale walls by attaching a proximity mine to it, and jumping on top of it, and repeating this process until e has reached the top (see Salen & Zimmerman, 2004).

While this way of playing the game allowed players to shortcut through carefully designed maps, it also is an indicator of player creativity that asserts itself even in games that are extensively playtested to prevent such occurrences from happening. This kind of creativity challenges the control the designers exert over the game, and can be seen as a way for players to assume their share of auctorial control (see Humphreys, 2005).

Cheats and exploits

Proximity mine climbing supplies an interesting borderline example for what constitutes cheating and what does not. On the one hand, one could argue that this practice is not cheating because it does not break the rules of the game. In fact, proximity mine climbing is only possible because the rules of the game explicitly define these mines as objects that a game character can stand on top of. On the other hand, the practice allows players to bypass substantial parts of the game, and could therefore be seen as not in accordance with the rules.

Theoretically, it should be possible to decide whether proximity mine climbing constitutes cheating by using the differentiation between operational, constitutive, and implicit rules which Salen and Zimmerman (2004) suggest, but the practice seems to cut across these categories. Proximity mine climbing is at once a breach of the game's constitutive rules, which make certain behaviours possible and others impossible, and a breach of its operational rules, insofar as there is no indication that taking shortcuts is a legitimate strategy in *Deus Ex*. However, the implicit rules of first-person shooters, as can be gleaned from player discussion boards and similar forums, tend to regard such practices as legitimate, as the following post from a discussion of a similar practice on *PlanetDeusEx* shows:

> I don't see exploiting querks [sic] in the game as cheating since anyone can do it without having to make any changes to the game. If the ability is there, but not intended by the dev[eloper]s, and anyone can do it once they find out, is it cheating? Exploiting maybe, but not cheating. (Lo Vaquero, 2004)

The distinction between cheats and so-called 'exploits' is often found in the popular discourse about games. Exploits are usually defined as bugs or loopholes in the game design that players can use to their advantage. Wright *et al*. describe one such exploit in the game *Counter-Strike* (Lê *et al*., 2000) that

allows 'dead' team-members to communicate with the living: "[A] fellow CT [counter-terrorist] member who is 'dead' [...] uses the vote command to place the following vote, 'vote Tom Tunnel.' The server issues an automatic response, 'Sorry, DeadEar, Tom Tunnel was not found on this server'" (Wright *et al*., 2002). In this example, 'Tom Tunnel' is a coded message by which a remaining team-member is advised about the way to approach the adversary team. This behaviour is subsumed under the heading of 'creative player actions' along with game features such as game talk, map creation and 'sprays'.

Meta-gaming

But outright cheating can also be creative. In *Deus Ex*, players are given the opportunity to assume authorial control to a much greater extent than suggested by the example of the 'iamwarren' cheat. Typing 'legend' into the console brings up an entire menu of options for players to experiment with. This menu includes an option to load a map, enabling the player to move around freely in the world of Deus Ex without using the cumbersome 'open <level name>' cheat, a 'jukebox' that plays the music from all the *Deus Ex* levels, and a number of debugging features such as 'Add/View Dump' and 'Invoke/Show Class'.

The "Behind the Curtains" menu also contains the "Edit Flags" command, which allows players to tamper with the game state by changing the value of certain parameters. This feature has inspired a sort of meta-game, the goal of which is to find out whether the game's storyline can be altered by killing (or resurrecting) certain key characters. A thread on the *Through the Looking Glass* forum begins by describing how a character that was assumed to be invincible can be killed early on in the game:

> On the training mission, at the last section where you have to cross the canal. If you put on cheas [sic] you can walk into the control room with Jaime and Bob Page. Once in this room you can freely Kill Bob Page, But not Jaimie [sic]. Using the Legend cheat shows a flag appear named something like BobPage_dead set to true. (SJamieson, 2002)

A user identified by the handle 'ferret' (2002) than takes up the challenge, and describes his efforts to systematically remove a number of key characters. After killing off Sam Carter, Jaime Reyes, Paul Denton, and Joseph Manderley in the first mission, he concludes that "it's now impossible to finish this mission without summoning […] new characters." Therefore he uses a cheat to go to the next level, and is surprised to "see Anna running towards you for a fraction of a second [sic], until the game realises she's dead."

After a while, this leads to such grave errors in the internal game logic, that the game crashes, and the experiment is aborted. One could conclude that the meta-game is a failure, especially since the story up to that point progresses entirely the same way as it does normally, except for the absence of the characters that have been killed. However, this conclusion would disregard the pleasure that the contributors to the "Killing Bob Page" thread experienced while

playing *Deus Ex* in this highly unorthodox way, which is repeatedly signalled by comments such as 'interesting' or 'intriguing' in regard to ferret's findings.

Intertextuality

As Vitas (2001) points out, Deus Ex is a game that is full of intertextual references. As he explains, "the use of an 'ICE-breaker' is more than a nod in the direction of Gibson's *Neuromancer;* the mention of a lunar mass-driver accident sounds like something out of Robert Heinlein's *The Moon Is a Harsh Mistress;* the presence of a character named Morpheus […] seems to suggest the Wachowski brothers' Matrix; and finally, there are also some mysterious men in black who look and behave, well, like Men in Black" (p. 186). And he does not even mention the allusions to canonical texts ranging from the Icarus myth to the *Bible*, and from Sun Tzu's *Art of War* to Thomas Aquinas' *Summa Theologica*.

The intertextual dimension of *Deus Ex* is also reflected in the cheats available for the game. We have already mentioned the generic cheats that evoke other game texts like *Doom* and *Quake*, but these are merely weak allusions. A more concrete example for an intertextual cheat is the 'Matrix' cheat, which is activated by going to the credits screen, and typing 'thereisnospoon'. This resultss in a radically different visual experience, since all the textures in the game are replaced by glowing green characters scrolling in front of a black background, a style strongly associated with the visual style of the *Matrix* film trilogy.

Again, the way the cheat is activated is significant. First of all, the words "there is no spoon" refer to the dialogue between *Matrix* protagonist Neo with a boy that he meets in the apartment of the nameless Oracle (Gloria Foster). "There is no spoon" has since become a sort of clichéd shorthand for pop Buddhism on the internet and elsewhere, and is often used to suggest that physical reality is merely a reflection of the mind. It is also significant that the cheat is activated by typing 'blindly' with only auditory cues as to the efficacy of one's actions, because it is reminiscent of the way hackers are revered as almost mythical figures with magic powers in both *The Matrix* and *Deus Ex*.

A similarly complex intertextual network is evoked by the 'tantalus' cheat, which enables the player to instantly kill any character or monster that is targeted by her avatar. The name of this cheat ostensibly refers to the Tantalus myth, which is an association that is not entirely out of place, considering that the Tantalus myth is often regarded as a variant of the Prometheus myth, and *Deus Ex* has a strong Promethean subtext. However, the actual reference seems to be to the *Star Trek* episode "Mirror, Mirror" (1967), in which a 'Tantalus field' is used "to monitor and eliminate enemies from existence with the touch of a button" ("Tantalus field", 2006).

Codes of technicity

Another category of cheats warrants our attention because it refers directly to the materiality of the computer, and thus foregrounds the machine-ness of computer game play. *Deus Ex* can be regarded as a game that self-reflex-

ively exhibits the way it entrains the user in a process of "becoming-machine" (Deleuze & Guattari, 2004) by a number of intra- and extratextual devices, such as the use of the central metaphor of the cyborg. While *Deus Ex* is not the first game to feature a cyborg protagonist, it is certainly a game in which the cyborg identity of the central character plays a much more important role than it does in most other games. The cyborg metaphor also explains why JC is able to use the bio-modifications he picks up along his way through the game world to change certain aspects of his physique.

The cyborg identity of the protagonist also functions as a marker of the user's technicity. As Dovey and Kennedy (2006) point out, the "connection between human subjectivity and our use of technology has come into even sharper focus as the machinery of computing has been woven ever more closely into the fabric of our everyday lives" (pp. 15-16). Their definition of technicity builds on Tomas' (2000) definition of the term as "the social regeneration of ethnic identity under the influence of cyborg-governed processes of *technological* differentiation in marginal late-capitalist creolized technocultures" (pp. 175-176, emphasis in original).

While Tomas is primarily concerned with the dystopian future depicted in William Gibson's *Sprawl* trilogy, Dovey and Kennedy (2006) maintain that "this notion of technical virtuosity, of a particular easy adoption of and facility with technology, is a fundamental aspect of the contemporary ideal subject within the technosphere." But technicity is more than just a facility with technology, it is a concept that encapsulates "the connections between an identity based on certain types of attitude, practices, preferences […] and the importance of technology as a critical aspect of the construction of that identity" (p. 17).

Deus Ex foregrounds this facility with and dependency on technology, for example by enveloping the user in the double economy of 'health' and 'biopower' but also by making the bio-modifications a central gameplay element. In regard to the plot the question to what extent identity is determined by technology is also central, as it emerges that the protagonist is an experimental prototype of a biotech-augmented human created by the secret US government agency Majestic 12. Crucially, this is also reflected in the kinds of cheats that are available for the game.

The player can accelerate the process of cyborgisation by using the 'allaugs' cheat, and as already mentioned he can gain possession of an augmentation not available through regular gameplay, the Tantalus device. More importantly, however, there are cheats that allow the player to exert control over the way she relates to the technological apparatus of the game by changing the way the avatar relates to his virtual environment. Most significantly, the 'fly' and 'ghost' cheats remove arbitrary restrictions to the movement of the avatar. While this is similar to the way that 'proximity mine climbing' allows player to shortcut through a level, these cheats have the added advantage of exposing the way the technology of the game.

The 'fly' cheat removes the condition that the avatar can only travel upwards if he is using mechanical means such as stairs, an elevator or a helicopter, while the 'ghost' cheat turns off the process called 'clipping', which determines wheth-

er an object in the game world is visible (and accessible) to the viewer. Turning 'clipping' off thus renders walls permeable. This might seem trivial since to an outside observer it may appear obvious that these restrictions are not 'natural' but simply arbitrary conventions imposed on the game world by its designers. However, employing the 'fly' or 'ghost' cheat after having played the game for a while is a truly eye-opening experience due to the fact that the artificial 'gravity' and 'boundedness' of the game world becomes naturalised during gameplay.

Only when the avatar floats over the game world does it become clear that the architecture of the game functions as a means of control to which the player submits, albeit joyfully. The freedom of choice *Deus Ex* offers is one of the main reasons why the game is so highly regarded by critics and players alike, but at the same time it is important to keep in mind that this expansion of the possibility space of the game is, as Slocombe (2005) argues, "fundamentally an illusion of choice." As he points out in regard to the *Deus Ex* sequel *Invisible War* (2003), "player interactions are […] determined be the 'rules' of the game and are never truly interactive." In other words: "Just as the player plays the game, so too the game 'plays' the player" (p. 46).

This double structure of control (where the player controls the game, while submitting to its control at the same time) is exactly what is revealed by these cheats. Importantly, this allows us to see that the playability of the game is dependent on this control structure as well. The extent of the player's control over the game when she uses these cheats is paramount to the control the game exerts over the player, so the game ceases to be a structure for meaningful play.

Quite literally, using the 'ghost' cheat removes the solid ground from under the avatar's feet, by rendering every solid structure in the game permeable, including the floor. This makes the experience of playing the game in this way a quite unsettling experience, and the player is reminded how the "topological constraints" (Aarseth, 1997) of gamespace are not just impeding the narrative thrust but also provide a structure for the events within the game world.

DISCUSSION

As the analysis of the cheats available for *Deus Ex* shows, cheating can radically alter the player's experience of the game world. Cheats can sped up narrative progression, change the perception of game space, and enhance the player's agency in the game world. One way of approaching cheats theoretically, then, is to look systematically at the way they influence the experience of such basic categories as time, space and subjectivity.

As Fuller and Jenkins (1995), as well as Lev Manovich (2001) point out, narration becomes 'spatialized' in adventure games, i.e. narrative progression is mapped onto the three-dimensional space of the game-world (see Kücklich, 2007a). From this point of view, speeding up narrative progression can be regarded as a condensation of space. Therefore, certain types of cheats can be understood as effecting a change in the way players perceive gamespace .

In regard to their potential to change the experience of space, it makes sense to consider cheats in terms of means that can be used to overcome

the topological constraints of the game. After all, the pleasure of any game depends on a balance between its rules and the freedom these rules leave the player for unconstrained interaction. From the player's perspective, playing can be regarded as a dynamic process that oscillates between a maximum and a minimum level of constraint.

Once the game process goes beyond either one of these thresholds, it deteriorates into a state of over-codification or a state of contingency, both of which leave the player at a loss for what to do. 'Being stuck' in an adventure game can be regarded as an instance of over-codification, since there are more conditions for narrative progression than the player is able to meet. Cheats can solve this dilemma by decreasing the perceived level of constraint in the game, thus setting the playing process in motion again.

Another type of cheats changes the players' perception of game-time. Indeed, the continuous interaction (without the avatar's intermittent 'death' and 'respawnment') made possible by the 'god mode' of many first-person shooters is bound to change the perception of time radically – from striated time to smooth time, to borrow a spatial metaphor. Since time is such a crucial factor in most action games, the cheats found in this genre are essentially time-savers: For example, cheats that unlock the different areas in which the game's action takes place have a similar effect of reducing the time that would otherwise be spent playing towards this goal.

Cheats that increase the range of options available to the player can be said to change her perception of the relation between the subject and object of play. As Donald Winnicott (1965) has pointed out, children learn to differentiate between their selves and the outside world through transitional objects, which are often toys. In digital games, players have the unique opportunity to reset the parameters of that rather stable sense of agency that has been developed by the end of childhood, and cheats that allow them to change the level of openness enhance these possibilities of experimentation even further.

This last point warrants some elaboration. The discussion of 'identification' in video games has often revolved around the impossibility of 'fleshing out' player characters, because this seems to make them less suitable as a conduit of the player's agency. The most successful video game characters seem to be those that do not have much of a personality, such as the nameless protagonist of Doom, who merely functions as a 'placeholder' for the player in the game world. *Deus Ex* is particularly interesting in this respect, because it offers the player different ways of playing JC, covering the entire spectrum from gung-ho warrior to cautious assassin.

This may increase the sense of agency that the player has in regard to the game world, but as we have already seen, much of this freedom is an illusion that the game creates by presenting the player with a range of options which appear to correspond to meaningful choices. But as the futile attempts to change the plot of *Deus Ex* described by participants in the *Through the Looking Glass* forum demonstrate, the plot of the game cannot be changed even when key characters in the game are removed. The subjectivity of the player can thus be seen to derive from her subjection to the control of the game.

Control thus emerges as a central concept in the theorisation of cheats. If we regard video games as governed by an 'aesthetics of control', cheats are not only a means to influence the equilibrium of control between game and player, but also a way of studying how different control mechanisms interact with each other. Cheating is thus not only a worthy object of study, but also a method of studying games (Kücklich, 2007b). It is a practice that allows us to upset the balance of control that makes games playable, and learn more about the internal mechanisms of games.

However, our discussion of the cheats available for *Deus Ex* has also drawn attention to the fact that even cheating in single-player games is not entirely removed from the social, political and economic contexts in which gaming takes place. On the contrary: cheating highlights the way auctorial control is simultaneously asserted and subverted in games; it draws attention to the way game rules are socially constructed rather than being built into games; and it points towards the political implications of gameplay by demonstrating how ideology becomes enmeshed into gamespace.

CONCLUSION

This overview of the cheats available for *Deus Ex* suggests that cheating allows the players to engage playfully with the control mechanisms they are subjected to. While it is undeniable that part of the pleasure of playing video games stems from submitting to their control, while at the same time exerting control over the game, this is also a powerful ideological apparatus that must be approached critically. Therefore, cheating should not be treated as a shameful practice unworthy of serious games research, but as a way of building up critical media literacy.

This is, of course, also a political argument. As anybody who plays games is aware, the public discourse about games is still informed by moral panics about violent content, sexual and racial stereotyping, and a general focus on the 'effects' of games, rather than the way gamers engage with them. While much cheating is certainly unreflected, and serves only to play games more effectively, thus in effect reinforcing their ideological messages, we have also seen examples of how cheating can be used to engage with games in a more critical fashion.

The theoretical importance of cheating thus can be seen to reside in the fact that it allows us to approach games in a way that avoids both the glorification and the demonisation of games by emphasising the different ways they can be played. An ideologically dubious game such as *America's Army* (2002) can be played in a way that foregrounds the inner contradictions of its ideology, and thus become the catalyst for critical thinking. But even a game like *Deus Ex*, which arguably encourages a critical engagement with the text, and avoids reductive us-vs.-them scenarios, can be played in a way that disregards these distinctions, and simply reinforces a certain world-view.

An approach that takes the possibilities of 'illegal' manipulation of the game into account is therefore not only able to regard games in terms of their cultural, social and political embeddedness, but also in terms of their mutabil-

ity. Just as cheating can be seen to de-centre the text of video games, an awareness of this mutability appears to foreground the fluidity of games, and the subject positions that they offer to players. This is perhaps the most significant way in which cheats can alter the experience of playing a game.

But that doesn't mean that the other ways in which cheating can change our perception of game space, game time, and our own agency in the game world are not important. The various ways in which the player is able to engage with the text through cheats all contribute to a deeper understanding of how video games work, and why they remain a source of fascination, even when their secrets have been exposed. Thus, cheating can be seen as a way of extending gameplay to another level.

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Thomas Duus Henriksen

Extending Experiences of Learning Games: Or Why Learning Games Should Be neither Fun, Educational nor Realistic

When extending the experiences of games, it is interesting to consider how games can be deployed in order to extend an experience, not towards making the game-experience more intensive, but to extend it into the lived lives of the players. Although such purpose would resemble that of a learning game, it is questionable if such an effect can be realised on basis of those assumptions and understandings that currently are constitutive to how we approach and think of learning games. In this chapter, I'm addressing how such understandings and assumptions, which draw upon inherited knowledge and techniques from disciplines like game-design and educational theory, affect how learning games currently are being understood, deployed and developed. Such heritages are especially visible when it comes to determining what is to be considered a good learning game.

The purpose of this chapter is to provide a view on how different understandings of learning games provide different opportunities for deploying and developing such games. In doing so, the currently accepted understanding of learning games as being *an educational experience that makes it fun to explore a realistic1 representation of a phenomenon* is addressed in respect to how and what effects it has to the area. Through this approach, the questions of *participatory incentives, learning and validity* in learning games are readdressed through the investigation of what effect alternative approaches might have in respect to the deployment and development of learning games.

While asking the question on what effect these currently dominating understandings have on the learning process, as well as to the effect of their alternatives, the chapter seeks to address how readdresment might provide new means for innovating learning games. In order to address such a question, the chapter sets out to present how current approaches have a limiting effect to the development and deployment of learning games, as well as to present a framework for understanding of learning games that incorporates the current as one among several possible approaches. In this chapter, the interactive constitution between the phenomenon of learning games and the understanding of learning games is addressed through the use of discourse analysis. The purpose of this approach is to address how understanding and phenomenon are mutually constitutive (see Henriksen, 2007a), and that these constitutions

are contingent, and therefore are subject to change. The purpose of using discourse analysis is to explicit that the analysis makes a specific, analytical cut, which constitutes the investigated phenomenon in a particular manner. The purpose is not to attempt to formulate an all-encompassing understanding of learning games, but to provide a view on the effects of a particular understanding of learning games, as well as providing an optic on how the mobilisation of alternative constitutions would affect the area.

While addressing the three answers; *by making learning games fun, by making them educative through the exploration of an academically enriched content*, and *as realistic representations on an issue*, which are the commonly accepted answers on *how to provide participational incentive in learning games, how to embed learning processes,* and *how to understand the game-provided knowledge and insights*, a framework is needed for addressing those lines of thinking that provide these questions with answers. When mobilising discourse as an analytical strategy, the answers fun, educational, and realistic can in the in terms of Laclau and Mouffe (1985) be framed as discourses, occupying the nodal points of *participatory incentive*, *learning* and *validity*. In the occupation of a nodal, a discourse has conquered the privilege to dominate the understanding the issue or question of that nodal.

The reason for addressing the nodal points in this analysis, is that they are discursive battlegrounds due to their ability to affect the questions and issues proposed by the surrounding elements. As a discourse occupies a certain nodal point, its understandings, meanings and values are imposed to the issues of the surrounding elements. If, for instance, a nodal on game-experience within game-design was to be occupied by a discourse stating that *games should the player a sensation of realism*, the presentational nodal within gaming would be occupied with a 'sensation of realism' discourse, which would effect the surrounding elements of *graphics*, *sound*, *game-play*, etc. in terms of reflecting the occupying discourse. In effect, the discourse provides a specific understanding on an issue, rendering alternatives as invalid, thereby closing the issue; anyone saying something different than the currently reigning discourse is (according to the discourse) wrong. The reason for addressing the three discourses concerning fun, educational and realism is that they are deployed in a very powerful manner when challenged, indicating that they are deeply rooted, as well as being very influential in respect to the overall understanding, deployment and development of learning games.

Discourses are deployed by enacting them in respect to a problem or phenomenon, allowing the discourse to imbue it with a certain meaning. The deployment of the fun-discourse could occur e.g. by making a learning game fun. Another deployment can be seen through questions like "Should they rather be boring?" which are commonly used to keep the current discourses in office by framing the alternatives as absurd. Such defensive mobilisation has the double effect of expressing the ideas of the discourse, while maintaining its dominance through contrasting the alternatives. Such mobilisation is of great analytical values, as it addresses the manifestation of discursive differences. Through his concept of 'la différance", Derrida (1976) observes how a

discourse is manifested through the use of active exclusion, allowing analysis to address how specific discourses are being excluded from being valid providers of meaning.

In this chapter, I try to ask such Derridan question on the effect of the exclusion and the excluded, addressing those answers and perspectives that are actively prevented from being meaningful on the issue. By addressing the excluded, the perspective allows the discursive struggle to be unfolded, from which the competing discourses to be explored. To do so, the analysis addresses the utterances or enactments that constitute the current discourses, as well as to those which employs or expresses a different meaning than the nodal-dominating discourse.

The scope of deploying such approach would not be to attempt to formulate an all-encompassing understanding of learning games; rather the objective would be to provide a view on the effects of particular understandings of learning games, as well as providing a view on how the mobilisation of different constitutions would have an effect. The analytical perspectives presented above are therefore mobilised tools for analysing learning games, not as a tool for providing an all-encompassing theory on the subject.

THE EIS SIMULATION

The impact of the conditioning of fun, educative and realism is empirically investigated through two Nordic deployments of the *EIS Simulation* (*EIS*). The *EIS* is a learning game on change management, which provides its participants with the challenge of having to implement a new technology, an executive information system, into a large European company. The aim is to change the attitude of the top managers from being unaware of the system, to become increasingly more interested, into finally adopting the system as their own. The game lasts for 105-115 minutes and is played cooperatively in groups of 4-5 participants. During the game, the participants receive step-by-step feedback on their implementation efforts from a computer interface. One such move could be to put an article in the company's *internal magazine*, or to have a *face to face meeting* with a director. On basis of the previous actions taken and the current state of affairs in the company, the simulation provides the participants with qualitative feedback along with a score. The feedback is often surprising to the participants, pointing their attention towards factors and interplays in the implementation process that the participants were unaware of or merely underestimated in respect to their impact on the change process.

The game is deployed in order to provide the participants with a hands-on experience on the difficulties and opportunities in change-implementation, and is currently being used world wide as an educational tool for teaching change management at master-level, as well as for supplementary purposes. Besides the Anglo-Saxon version used in the two deployments, the game can provide scenarios for e.g. family companies or Chinese organisations. For the sake of the participants, the specifics on names, places and companies have

been anonymised. This chapter draws upon experiences from two deployments; the XX, which included participants from several different organisations, and the YY, which ran as an internal event in a large Nordic cooperation.

ADDRESSING THE NODALS

Throughout the following section, I will explore experiences from the *EIS* in respect to the constitution of meaning and the mobilisation of fun, educational and realistic, as well as to how experiences from the *EIS* are able to provide a view on how learning games can be understood differently. While looking into the discursive field of the *EIS*, understandings that have not been able to dominate the understanding of learning games are addressed in respect to their emerging effects, thereby providing an alternative understanding of learning games than the one provided through the mobilisation the of fun, educative and realistic discourses.

NODAL 1: FUN AND THE PARTICIPATIONAL INCENTIVE

Needless to say, making games fun is the key objective when it comes to commercial gaming. Game-design literature is rich on perspectives on how to put fun into games (see e.g. Rouse, 2001; Bates, 2004), to avoid fun-killers (see e.g. Fullerton, Swain & Hoffman, 2004), or balancing fun against other issues, e.g. realism (see Bates, 2004). The purpose of these efforts is to create enjoyable experiences that motivate the player into buying and playing the game, as well as to recommending it to peers. Despite the great emphasis on how to make games fun, the issue itself is rarely addressed. The motivational impact of commercial games is astonishing; who haven't seen someone immerse into playing computer games like Blizzard's *World of Warcraft* (2004) and be amazed by its ability to do so? This motivational mobilisation has surely interested educational designers, asking "How can we utilise this motivation for learning purposes?" Such lines of thinking gave rise to the conjunction of learning and playing, commonly referred to as edutainment (see Konzack, 2003), a special breed of games with an enriched content, which were to be used for educational purposes.

Although being a moderately successful industry, the approach has been widely criticised, partly for not being very successful in providing educational benefits (see Egenfeldt-Nielsen, 2005), but more commonly for failing to make the learning processes fun enough to compete with commercial gaming. While having to communicate a certain content, edutainment is limited by this content, whereas commercial gaming is capable of balancing the two more freely. As Bates puts it, "[i]n the end, fun game play is more important than realism, so if a balance can't be found and a tradeoff is necessary, fun wins." (Bates, 2004, p. 65), giving commercial game designers more freedom to meet what experience the player would appreciate the most, whereas the balancing represents a key issue to educational game designers. Despite

such challenges, the area has maintained the emphasis on fun that it inherited from commercial gaming, as well as the understanding of games it came with. Within learning games, fun is given the same position as in commercial gaming, seeking to make learning fun (see e.g. Barab *et al*. (2005)) in order to motivate participation.

In terms of discourse analysis, one could say that the discourse stating games as fun has managed to occupy the nodal concerning the motivational issue. This heritage is largely unchallenged, and while fun is being the prime purpose of a commercial game, the same understanding is handed down to learning games, to which the presence of the game element in the educational setting is understood as to bring fun into the learning process.

This understanding seems to be very deeply embedded among learning game practitioners, and is especially present when trying to make an easy sale. The underlying discourse of fun is commonly enacted in the presentation of learning games by facilitators, who present learning games as something fun to look forward to. It is also present with the participant, whose expectations to the game-based learning experience is shaped by their conception of games in general – as something fun to play. The discourse is so deeply embedded in the understanding of learning games that it is beyond question, and by eliminating the contingency on the issue, a shared understanding of the issue is provided. When being challenged, the discourse becomes even clearer; during a keynote speech, I rhetorically asked whether it should be fun to play learning games, to which a person in the audience replied "Yes, otherwise we'd might as well teach!" Such defensive mobilisation showed very clearly the solid rootedness of the discourse. Another common mobilisation of the fun discourse would be the Derridan question on the alternative – "should they then boring?" which frames the logical contrast as unattractive or absurd.

Despite the critique, the mobilisation of fun on the issue of providing participational incentive in learning games clearly has some effects to the game based learning process in order to generate activity by motivating participation. The heritage allows educational game-designers to draw upon experiences from commercial games in order to create engagement in the game activities, but with this heritage comes also the challenges within commercial game-design. One such significant challenge would be the balancing of realism against fun, which to learning games would constitute a prioritizing between educational elements and fun. Although being caught between the values of commercial gaming and those of education constitutes a dilemma to learning game-designers, the conjunction between fun and education is commonly presented as the purpose of game-based learning (see e.g. Prensky 2001.

The main effect of this discourse would then be to frame the learning game as a fun mean for generating activity within a learning process. By allowing the question of motivation to be answered by the fun discourse, fun becomes the key driver for the process, as well as to the whole question of why to use learning games. When a discourse is allowed to dominate the question

proposed in a nodal, in this case the question on participational incentives in learning games, the effect has two faces: First, it provides the right answer, in this case stating that learning games should be fun in order to motivate the participant into taking part in the activity (which is then assumed to be educative). Second, while constituting one understanding as right, it renders alternative understandings as being wrong, in this case proposing the purpose of learning games to be something different than being fun. From the perspective of discourse analysis, such an understanding is a social construct that allows us to think about learning games in a particular manner. Having the question of fun or not settled in advance, attention can be turned towards designing it, but such fixed understanding can also be a hindrance in thinking and innovating learning games in new directions.

One way of trying to innovate on learning games would be to elaborate on the conception of fun, asking what alternative understandings that could exist within the current terminology. One radical understanding is proposed by Papert's (1998) concept of hard fun as the result of frustration and challenge. A more radical approach would be to investigate what alternatives would go beyond the current understanding of the purpose. Rather than seeing the game as a tool for motivation, emphasis can be moved to seeing it as an educational tool: instead of asking *how a specific learning process can be made fun* (though a learning game), it is interesting to ask *how to incite participation in a specific learning process*, and thereby moving emphasis away from fun (discourse) as an answer to the question of motivation (nodal), thereby opening the issue to competing discourses.

One approach for addressing such alternative discourses is provided by Malone and Lepper (1987), who proposes a framework for creating intrinsic motivation in learning processes. Through the investigation of learning games, they found the game-provided feedback to be the most significant determinant in creating intrinsic motivation, allowing the content itself to be thought of as a motivating element. In their chapter, Malone and Lepper provide a comprehensive taxonomy for addressing intrinsic, participatory incentives, comprising challenge, curiosity, control, fantasy and interpersonal incentives, seeing these as tools for enhancing the effect of extrinsic incentives. When deployed from a constructionist perspective, Malone and Lepper's taxonomy can be seen as an analytical perspective for understanding how participational incentives are being used in learning games, as well as to what effect they have.

The aim of using such application would be to point out that although fun would be the dominating discourse on the question on why learning games, it is important to see how other discourses are active and affect the field in order to be able to innovate on the area. As an overall distinction, the participatory incentives can be divided into goal-orientated incentives, providing the overall reasons for taking part, and activity-orientated incentives, which are closely related to playing the game itself. Although present as an overall framing of the *EIS* session, the fun discourse is only visible in the tone in which the game provides feedback on the participants' decisions. The fun discourse is, in other

words, active, but not being dominant to the participatory incentives of the *EIS*.

The *EIS* is interesting to look into due to its very untraditional approach to and mobilisation of participational incentives. When addressing the question on why participants take part in the *EIS*, the struggle taking place between different participational incentives becomes very clear in itself. Although framed as a beneficial and fun experience, other participational incentives are active in the persuasion of the participant into taking part of the game, and most importantly, to remain a part throughout the game.

Mobilising a sense of urgency on change

When applying Malone and Lepper´s (1987) taxonomy onto the *EIS* deployment, the constitution of a social incentive for participating seems to be mobilised through the introductive framing of the game, through which a sense of importance is mobilised: Change is being framed as something frequent, important and difficult to organisations, and by framing the skills of the change agent (a possible career opportunity for the participants) as a significant factor on whether the change process will succeed, or will fail like the other 70% do. By doing so, being able to master the task of change implementation becomes framed as desirable. This framing is made relevant, both through reference to current and future employment, but also among the participants, thereby providing both a participatory incentive, based on a long goal-orientation, as well as a social incentive by framing change mastery as socially desirable among the participants. The *EIS* is then presented as an opportunity to demonstrate such mastery. Beating the game by completing its implementation challenge becomes socially attractive in respect to demonstrate competence to others, as well as to creating a self-image as being competent in respect to handling change.

Allowing it to be harder than it looks

By staging the game as an opportunity to demonstrate a socially attractive competence, the participants eagerly embraces the challenge of the *EIS*, which turns out to be much harder than expected. As an educative statement, the game has been made just as hard to complete as it would be to implement an organisational change. As the participants realise that they may not be able to reach the objective, their experience can best be described as frustration in its classic definition; as the sensation of being prevented from reaching some desirable objective.

After the session, participants reported such desire in respect to demonstrating change mastery through the *EIS*, but being unable to do so, led to frustration. Rather than giving up, they decided to give it a try, well knowing that they had engaged themselves in a problem that was much harder than they were skilled for. While trying to make the best of it, they tried to crack its underlying mechanics to get some of the game's highly desired points.

Learning by disaster

While attempting to score at least a few points, a group from the XX deployment made leaps for the small successes. Rather than sticking to their plan, they took the process one step at the time while making slow progress. Then disaster occurred; while making a poorly placed decision, the groups lost the few points they had earned so far. This sets them back to where they started, but now with less time and resources to complete the job. As the disaster occurs, the participants become silent, and several starts thinking what this failure makes them look like. The facilitator walks through the door at the same moment, and is met with assurance that the group had much more points just a moment ago. After providing some advice on how to continue, the facilitator leaves, and the group starts working again. According to several participants, what seems to drive them here is not a desire to play the game, but to get at least some points in order to save face to the other participants, and it results in a very intensive combination of change discussion and game decisions. For better or for worse, what drove the participants through the last part of the EIS was clearly an attempt to get to better. The game surely got pleasant while receiving drops of positive feedback, but clearly the dominating sensation throughout the game was the frustration of not being able to master its challenge. This difference is probably what made the participants stay in the game, both when things got hard, but also when they went completely wrong for them.

Seeing the social incentives in play

In terms of discourse analysis, the nodal of participational incentive seemed occupied by a discourse of socially constituted, goal-orientated incentives. The fun discourse was barely visible, and not dominant to the game. Participation was incited through the staging of the game as an important and socially desirable challenge to master and by stating the game as an opportunity to demonstrate such mastery. Though this staging, the participants remained in the game despite realising that the game was harder than they could handle. This goes against Csikszentmihalyi's (1990) notion of flow, which is commonly accepted by game-designers as a recipe for making game-experiences highly motivating: By constantly matching the perception of the game-challenge with the player's skills, the participant is expected to mobilise an optimal level of motivation for participating.

By staging change mastery, and through that, *EIS* mastery as desirable to the participants, the game managed to stage a hard problem to the participants. Although the problem knowingly exceeded their change skills, they remained engaged in it. In terms of flow, the process can be illustrated as an anti-flow staircase, staging problems, to which the participants have to evolve their skills to solve before experiencing some degree of mastery. In terms of the model below, staging resembles a process where the participant is confronted with a problem that explicitly exceeds the participant's skills by using the

appropriate participatory incentives. In case of the *EIS*, the staging is performed by framing the task as socially desirable and professionally beneficial to master. Though such use of participatory incentives, the participant accepts to solve this problem, although this requires that the participant develops the proper skills for solving the task. When able to do so, the game provides the participant with a small token of mastery in terms of points and positive feedback, after which it stages a new problem to the participant. Due to the participant's acceptance of the task as desirable, the participant accepts the frustration of the challenge.

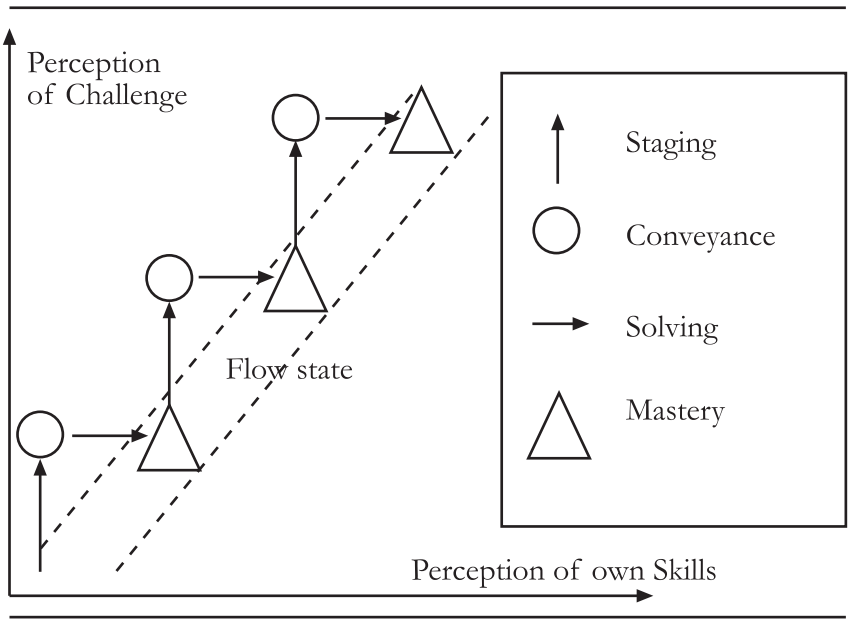

Figure 1. The anti-flow model on staging

From such conception, it would seem that frustration-based incentive is less sensitive to differences in individual participant skills than that of a flow-based, allowing a larger discrepancy between the game level and the participant skill. Such staging of the socially desirable is able to draw upon game-external sources for motivating behaviour, allowing the designer to draw upon a wider array of tools for constituting engagement in learning games.

Staging a problem as opposed to making it fun

While employing the fun based approach for inciting participation, attention is paid to how the activity itself is rewarding to the participant, while the use of a staging approach emphasises the activities of the learning game as means to achieving some objective that is external to the game. The staging approach does not mean that games have to be boring, nor does it preclude the use of fun, rather, it reduces

fun to be a possible side effect, as well as to become one of many tools for inciting participation in a learning game. As seen with the model above, the use of alternative participatory incentives allows the staging of difficult problems, processes and eventually benefits, which are addressed in respect to the next nodal.

NODAL 2: EDUCATIVE CONTENT AND THE LEARNING APPROACH

Having addressed fun as an occupying discourse for the participatory incentive, the question comes to asking 'participating in what?' to address the learning processes of learning games. When deploying fun as the participatory incentive, Bates (2004) pointed at the act of prioritising between fun and realism, which to learning games would be a question of balancing between fun and an academically enriched content that would represent whatever it was that had to be learned though the game. The learning game-designer's job would then be to turn some academic knowledge into mechanics and stories for the participant to explore. From such perspective, theories on game based learning would address how such processes were designed, as well as to how the participant would benefit from them. This line of thinking is found with Schaffer and Resnick (1999), who argues for the provision of authenticity in learning experiences, allowing learners to investigate complex systems, as well as with Aldrich (2004) who emphasises the role of the content in the educational experience.

In terms of discourse analysis, it is interesting to place the question earlier in the process, rather than contributing to further constitution of the content to be firmly settled as the place for the learning process of games to take place. Like in a good game of jeopardy, 'content' is only an answer, and the interesting part would be the question leading there, as well as the lines of thinking that bring the two together. An example of such link between content and game can be seen when it comes to endogenous game-design, which tries to draw a straight line from the dynamics of the phenomenon or subject to be taught to the game mechanics (see Malone & Lepper, 1987). The learning philosophy of the endogenous approach would be similar to Lave's (1999) practice orientated approach to learning, which assumes that the participatory exploration of a phenomenon or practice is likely to produce learning processes with the explorer, as well as in the concept of simulated practice learning (Henriksen, 2000; 2004), which addresses the game's ability to provide access to and participation in certain phenomenons and situation in order to provide practical conceptions of such. By employing such lines of thinking, it is not surprising that the answer on how participants learn from learning games becomes 'by exploring an academically enriched content'.

As with fun being the common answer to the question of participational incentives, allowing a content discourse to occupy the nodal of how to produce the learning process, has some effects to how learning games can be thought and understood, and from that, what ideas become meaningful to put into a design. As with the Derridan question on fun, it would be less meaningful to claim that content should not be related to the academic subject. While allowing the content discourse to occupy the question on where

to place the learning process, it would not make sense to move focus from content. But that would, in fact, be what Im about to suggest, namely to stop thinking about the content and the exploration of such as the game-based learning process.

Origin of the content

The underlying discourse of content is commonly enacted during design or game presentations through utterances addressing *what to put into the game, what the game does or what you can learn from the game*. By being able to explicitly embed an academic content into a game that game gains a unique selling point; while being comparable in content to other educational initiatives, emphasis can be turned towards other qualities like its ability to incite participation or provide feedback on specific decisions. By allowing the content discourse to occupy the question of learning, the game process becomes a question of exploring the embedded content, and in the end, to master its information and dynamics. As with most elearning, this process of exploration becomes synonymous to the learning, allowing the designer to focus on optimising this explorative process.

The heritage of the content discourse points back to traditional commercial game-design, which emphasises the game as something that starts when it starts and ends when it ends. It also employs a very rational approach to learning, assuming learning to take place upon exposure to knowledge. In order to meet with processual shortcomings, a facilitator can be deployed in order to repeat the game's points, and eventually decontextualise them into theoretical concepts (see Henriksen, 2004). Although such activities attempt to expand the learning process beyond the time span of the game, focus has remained on designing and exploring content.

Alternative approaches to learning though games

As with the issue of fun and games, the dominating discourse in respect to the question on how learning games create learning processes has two consequences: First it provides a clear answer on where to embed or look for the educational benefit in learning games, in this case in the content. Second, it states that if it is not in the content, it is missing. This has a clear impact on the underlying model on learning, which would state that the participant is able and expected to learn the content of the learning game, as well as relying heavily on a realistic, practice orientated approach to learning. While such shared understanding provide consensus on how to put learning into games, such fixed understandings are interesting to challenge in order to *innovate* learning games. As with the issue of fun, one approach would be to elaborate on the concept of learning, to investigate what other processes might be active. To do so, the analytical attention must be displaced away from content in order to find new ways of seeing learning processes in learning games. When investigating the two deployments of the *EIS*, four analytical displacements

can be seen in the cracks in the current discourse: *time, objective, orientation* and *nature of the knowledge.*

Time and learning

When designing a course or a seminar, the first thing you short on is time. As a consequence, learning games are often deployed in respect to how long time the actual game takes; less attention is paid to the preceding and following activities. From discourse analysis, such prioritising can be seen as a direct consequence of the content discourse, to which pre- and post activities merely are seen as supportive, whereas the game holds the real learning experience.

The two deployments of the EIS studied provide different views on learning game deployment: while the introduction to the game was very alike between the two sessions, the game-facilitation and the post activities differed. In respect to the pre activities, they consisted of three (3) elements: First, a general introduction to planned change implementation, success rate, frequency, structure and organisation of change, as well as proposing a diffusion strategy for implementing change. Second, an introduction to the game, consisting of a) a narrative introduction to the game's story, b) a ludological introduction on how to navigate the game mechanics and play the game, c) an introduction to the game interface. In respect to the game-facilitation, the XX deployment employed a 1-2-1 deployment (see Henriksen, 2004), starting with a theoretical approach to the issue, then the game was deployed as a practical approach, and then it returned to a theoretical approach qua the debriefing. The YY deployment utilised a theoretically informed approach (TIA), through which the game was played in thirds, interrupted theory sessions on *implementation stages* and *change failure* respectively. After the game, score and process for the different groups were concluded, after which the challenges of the game was addressed. With the XX deployment, the issues of implementation stages and chance failure was addressed, and the game discussed, whereas the YY group discussed the game in respect to the existing organisation, followed by workshops where upcoming change projects were planned, using the insights from the game.

In respect to the issue of time, both deployments placed a significant element of learning activities outside the game, allowing the two to have a mutually supportive function to each other. Whereas the introduction sought to dress the participants theoretically to meet the challenge, the game provided an opportunity for seeing some of the introduced perspectives in practice, which again worked as a practical example or experience for the post-activities and its theories. As with the TIA approach, providing an interrupted experience to the participants' game-flow, the connection to the theoretical perspectives was strengthened even further. Such addresment of the learning activity as distributed over time, allows us to see the learning processes, both as theoretical introductions and follow-ups, but also as relations between these theoretical activities and the game activity.

Objective to learn

When thinking in lines of content, the learning objective would, logically enough, be to communicate as much of that content from the learning game to the participant. But rather than seeing success in line of having communicated a content, it would be interesting to see what other objectives the learning game would be able to stage processes on. Such emphasis employs Højbjerg's (2005) distinction between decisional and negotiational game-processes, from which the *EIS* can be seen as a game of making the right decision (in respect to content), or to negotiate what decision to make (derived from content), or even as the application of both. Through such analytical perspective, attention is paid to how the decisions and operations concerning content allows the staging of other (derived) processes. The first would be the group process encountered at the XX deployment, the second the applicative discussion encountered with the YY deployment.

Staged group processes

At the XX deployment, the group whose game experience was addressed further above (in respect to fun and participation), had a very interesting group process. In respect to the discourse of exploring a content, it turned out problematic by inhibiting the exploration, but in respect to thinking in different learning objectives, the game managed to stage a very interesting group process in respect to cooperation across cultural and educational differences, risk willingness vs. planning, as well as in respect to social positioning and the constitution of informal power (see Henriksen, 2007b). The staged group process had very little in common with the content of the learning game, but was merely an outcome of the conjunction between the differences that meet in a conflictual situation, combined with the different opinions on how to approach the shared task.

The group process would be one example of a staged process that could be used for educational purposes. Although the process is derived from the game content, it draws more extensively on the setup than the content of the learning game. Furthermore, it allows for an open-ended process; while there are rights and wrongs to be explored from the content of the *EIS*, the staged processes would address the social constructions taking place between the participants.

Staged applicative processes

At the YY deployment, the *EIS* session (briefing, game and debriefing) ended with a workshop on future changes within the organisation. The purpose was to plan upcoming change processes on basis of the insights from the *EIS* session. Although the purpose of the workshop was to plan change, the applicative discussions constituted a facilitator guided learning process. While the quality and the outcome of the plans conceived are unassessed, the partici-

pants actively applied the insights gained from the *EIS* session as analytical perspectives during those workshops.

In terms of learning objectives, learning games provide an opportunity to stage learning processes that are not directly associated with the communication of an embedded content, rather they can be understood as *constituted* by the embedded content.

Orientation of attention

When thinking in lines of content, there is an assumed connection between the exploration of content and the ability to address game-external issues, making it unaddressed *what* is actually being explored. Again, the question can be addressed by looking across the two *EIS* deployments, providing a view on the differences between the competing discourses: With the XX deployment, attention was staged towards exploring the game as a model of reality on the subject of change. This was supported by drawing upon generic examples on organisational change in order to explain the processes and feedbacks of the game. With the YY deployment, attention was staged towards exploring how the existing organisation could be understood. The different attention affected the orientation of the two sessions: With the XX, attention was paid to understanding the game-embedded processes, seeking to provide a clear view on how to approach change implementation projects; with the YY, attention was paid to providing the participants with analytical tools for understanding, planning and implementing future changes in YY's organisation, seeking to equip the employees. While one learning process turned attention into the game, the other turned towards the organisation.

Nature of the knowledge to be learned

When thinking in lines of content, if not only affects the question on how to create learning processes, it also affects the surrounding questions on what kind of knowledge the learning process then provides. As with an embedded content, the main concern for that learning process would be to acquire this content, making it acquisitive in its attempt to communicate something specific. Such effect is closely related to the idea that the learning process is aimed at the particular exploration of the content, and the participant's subsequent adoption of its line of thinking.

In order to see other understandings of knowledge in the learning game, it is interesting to look into what falls outside the particulars of content acquisition. Sfard (1998) proposed a metaphoric distinction between acquisitive and participatory learning processes. Her point was to state the differences, as well as to point out that each of the two understandings only gave a limited understanding on learning processes as a whole. While the content discourse on learning games clearly draws upon the acquisitive approach of seeing knowledge as one-to-one representations, it interesting to see how learning proc-

esses unfold themselves as 'messy' participatory construction processes in the learning game.

In the two deployments, two kinds of construction processes can be seen as parallel to the acquisitional process: In the XX deployment, a) a continuous formulation of hypotheses on cause and effect were turned inwards towards exploring the game, but in a manner that allowed the participants to formulate their own idea of causality, b) a construction of social structures for the group process, mainly in concern to decisional processes. In the YY cohort, the participants quickly moved from the acquisitional process to that of applying the provided perspectives onto both a general understanding of their organisation and onto concrete, upcoming change projects. This allowed the participants to construct local understandings of change.

In both cases the acquisitional exploration of content acted as foundation for staging the more applicative and practical learning processes where the participants constructed a situated understanding of change. As Sfard pointed out, there is a danger in only choosing one metaphor for understanding learning processes, both processes probably provide the participant with valuable knowledge on change; the participatory processes of constructing personalised understandings of the game's points is probably the most important one for initiating the transfer process that allows the participants to decontextualise their insights out of the learning game, and recontextualise in respect to game-external problems. However, the construction based processes are staged on basis of the prior acquisitative processes, which states a need for including both approaches in the understanding of learning games.

From learning games to game-based learning

While looking into the EIS in respect to time, objective, orientation and the nature of knowledge in learning games, it provides the analysis with four alternative discourses for understanding, deploying and developing learning games; rather than understanding the learning process as *limited to the time spent playing the game*, learning processes can be pursued in relation to *colonialising before and after activities*, while de-emphasising the duration itself; rather than exploring the communication of an *academic content*, objectives can be looked for as *derived activities*, both in respect to time and subject; rather than understanding the purpose of the learning session as *orientated towards the game-activity*, the learning process can *address issues that are external to the activity* in terms of succeeding practices; and rather than thinking the educational benefit in terms of *representative knowledge*, it can be thought of as the *construction of new knowledge*.

In short, though the analysis of the *EIS*, views have been provided on how to change emphasis away from the game and its content. Such views can be seen as competitive to the content-based understanding, but although alternative, they are not to be read as replacive. Instead, they can be seen as 'design dimensions' (Henriksen, 2006b), as an analytical tool for identifying or designing crucial elements in a didactical design, providing the analysis with

an array of tools for understanding, deploying and developing game-based learning processes.

While the content discourse presented a very straight forward view on how learning games are educative through the embedded content, the discourse analysis seems to have done what it is supposed to; to take the taken for granted understanding and challenge it, and with the on how game-external and derived learning processes blend with both the game and the participants' practices, the concept of game-based learning seem to have a more inclusive approach to the different discourses presented above.

With the concept of game-based learning, emphasis is moved away from the learning game as an isolated process, and into the relationship established between the different didactic activities of the session, allowing the understanding of learning games to draw upon a wider variety of discourses. As a consequence, learning game design is similarly reduced to being one contribution to the design of game-based leaning processes. With emphasis placed on learning games, the game design would be crucial, but with the change of emphasis towards game-based learning, the didactical design of the interplay between the game and the surrounding activities becomes the new key issue to address, which calls for a more inclusive discursive approach to the area.

NODAL 3: REALISTIC REPRESENTATION AND THE EXPERIENCE VALIDATION

The third nodal occupation I will challenge in this chapter is that of representational realism, and how it affects our understanding of learning games. As with all discourse analysis, seeing an issue as irrelevant to pursue is an indication of discourse mobilisation, and in respect to the issue of realism, not seeing a need for addressing the realistic component is clearly an indication of a discourse at work. As with the issue of fun and educational, the mobilisation of a discourse provides distinctions on what is considered meaningful on an issue, and what is not.

The mobilisation of realism has a powerful impact on the surrounding issues, as well as to the two previous nodals, as it addresses how the game is being understood as a whole; the mobilisation provides the game-experience with a representational value, allowing it to be seen and used as e.g. a practical experience on a subject, or more generally, as a valid source to learn from. An example of such mobilisation can be seen with facilitators, who through references to reality, makes the game experience seem more believable to the participants. As a facilitator puts it to his participants: "It's frustrating, I can tell you now that it is not an easy game. But at the same time, it's a game that resembles very much the reality that many managers have to face in their organisations". thereby framing it as a realistic representation of reality, because reality looks and acts as in the game. An effect of such mobilisation is the assumption that if the participant is able to handle, and eventually win this game, he or she will be able handle similar challenges in a real organisation.

The mobilisation of the realistic discourse provides an answer to a question on how to understand the knowledge and insights presented by learning

games. By allowing a discourse on realism to occupy, and thereby provide the dominating answer on the issue, the knowledge provided by learning games is framed as representative to the reality it reflects, allowing game-provided knowledge to be taken as valid. The mobilisation of the realistic discourse has a powerful impact though out the network of interrelated nodals and elements, whose occupants conjointly constitute our understanding of learning games, allowing a certain approach to its learning processes. As a consequence, a practice orientated learning approach provides the answer to how the learning process is taking place, mobilising realistic approaches, such as the exploration of practices (see Lave, 1999), simulated practice learning (see Henriksen, 2000), or Dewey´s (1938) concept of learning by doing. Such theories not only help us in understanding the learning process, they also imbue the game with legitimacy as an educational tool. While presenting participation as beneficial, fun can be mobilised to ensure participation, resulting in an easy recipe for designing a learning game, but as the previous analysis proposes, alternatives seem to exist.

The defensive mobilisation of reality

The reality discourse seems to be manifested very firmly on the nodal, and proves itself visible when the discursive defences are provoked. As with being fun and educational, a commonly mobilised defence, is to question the sense of the contrasting alternative. As a game designer puts it: "[W]hich alternative do you have apart [from] presenting the game as being realistic, given that it is based on insights from reality? Would you introduce the session by saying [:] This game is NOT realistic [?]. It is pretty obvious to players that the simulated reality is NOT reality, and that the simulated organization is NOT their organization, etc." Despite making it clear that the participants do not perceive the game as reality (or at least are not intended to), the question remains on how to understand the provided insights. Framing the game as realistic by being "[...] based on insights from reality [...]" he states that the embedded knowledge is a realistic representation, as well as stating that framing a game as not being realistic (when it is so) is ridiculous. From such a strong mobilisation of realism, the participants are expected to understand the game-provided insights as representative to real-world experiences. From a constructionist perspective, assuming that a representation would be realistic, it would merely blind the participant of the perspective that the game was based upon, thereby establishing a myth of objectivity.

When participants make calls to reality

As mentioned earlier, both facilitators and game designers can make calls to reality in order to frame the game-experience as representative in respect to the subject. A similar call can be seen among participants, who mobilises reality in order to call 'foul play', usually due to a discrepancy between their personal and the game-provided experience on an issue. Common examples

of such can be seen through the utterance "That's not realistic!" followed by utterances such as "In a real organisation, where people navigated politically [...]", "That would never happen to me" or "This would never be the case at YY – we don't even have such gatekeepers". Such utterances mobilises the realistic discourse in order to point out that something is not realistic, and by doing so, proving it wrong. Realism is thereby established as an indication of quality and the counter-mobilisation as expression of a conflict between the game's and the participant's reality. If addressed within the realistic discourse, there is only room for one reality, and the other has to be turned down.

By manifesting the game-provided reality as the valid one, the facilitator can maintain a sense of game-validity. Otherwise, the representational validity would be broken, rendering the game invalid to learn from. The effect of employing a realistic discourse such occasions would be a very defensive effort with the facilitation in order to keep the participants' trust in the game. While the mobilisation of a realistic discourse would constitute an attempt to make the game's points constitutive to the participants' realities, alternative approaches based on humanistic approaches can be employed by taking an alternative approach to understanding the game-provided knowledge and insights.

Looking in or looking out?

The constructionist discourse is often seen mobilised as an alternative discourse, allowing the facilitator to address the differences between game-provided and participant experiences, and encourage an elaboration on differences. From such discourse, it is acknowledged that reality is a question of individual perspective and understandings, allowing different realities to coexist. The game-provided perspectives can then be used for asking *what would happen in a political organisation*, *what precautions would prevent certain things from happening*, or *how the organisation could be understood in respect to the gatekeeper function*. Through this perspective, the game is seen as experience, based on certain game-embedded, theoretical perspectives, which are interesting for understanding certain phenomenons. A key difference lies in the orientation of the process, which is aimed either towards the game in order to understand its processes, or outwards, in order to address the participant's practices.

Reality and the focussed perspective

The call to realism though the comment on political has the effect of framing the game as incomplete on the subject of change, thereby framing it as a bad game for providing a learning process on the subject. By stating that a crucial area is missing, the effect would be that the game is rendered obsolete or inferior, and is an often mobilised as a manoeuvre for criticising a specific learning game. Nevertheless, taking a theoretically informed approach to the mobilisation, the comment can be seen as addressing the issue of informal power:

According to Boonstra (2004), organisational change processes are commonly being categorised as either planned change or organisational development. Whereas planned change concerns the implementation of specific technologies in respect to routine problems in order to reach a specified result, Organisational development would address cultural or organisational issues in respect to addressing methodology and non-routine problems (*ibid*. p. 10), to which it is a key issue to determine the direction of the development. From this distinction, the political comment addresses an issue of organisational development, whereas the implementation challenge of the *EIS* clearly sorts under planned change. Although the comment is valuable for staging discussions on organisational development on basis of the game-based experience, it is fair to see the issue as beyond the purpose of the *EIS* simulation.

From the realistic perspective, the comment would challenge the game's ability to (fully) represent the subject of organisational change, making it possible to invalidate it. As an alternative, a post-structuralist approach to the game-provided experience can be mobilised to address the employed perspectives and their effects. From such perspective, the situatedness of the employed perspectives would frame them as different in their purposes, uses and effects, as well as addressing the social enactment of the two perspectives in contrast to seeing them as something in themselves. In effect, this would allow the game to make delimitations to its content, rather than having to perform as all-encompassing micro-worlds.

Personal discourses and analytical scopes

While allowing discourse analysis to provide a view on how to understand the knowledge and insights provided by a learning game, such approach may in many respects resemble the deployment of realistic discourse, but differs in respect to the attention paid to the enacted perspectives. The statements "That would never happen to me" or "This would never be the case at YY-company – we don't even have such gatekeepers." raise a question on what perspective the participant deployed in order to reach such a conclusion. Did the participant fail to notice some taken for granted process or relation in his or her own organisation, has the participant ever been subjected to the phenomenon discussed, or is the participant simply right? In order to examine this question the employed discourses must be addressed. By liquidating the representational value of the game-provided perspectives, their privileged position from the learning game is removed (see Henriksen, 2007b), turning them into analytical scopes for analysing game-external change processes. By addressing the participant's comment as an effect of a perspective, attention can be paid to how the participant analyses the issues of organisation, process and relation, thereby addressing the employed analytical scopes.

Through this approach, the game-provided perspectives become valid, not as something in themselves, but in the situation they are applied. If the issue on gate-keeping was addressed form a realistic perspective, a likely effect would be that the perspective was understood in respect to the scope itself,

and not to the application. When applied as an analytical scope, the effect is situated to the application, rather than rendering the perspective essentially bad in case it turns out unproductive in the specific application.

From representational knowledge to embraced discrepancies

Rather than accepting the realistic approach to the game-provided experience, alternative discourses can be seen in the cracks of the deployment of the *EIS*, offering new ways of understanding the game-provided knowledge and insights. As with the constructionist alternatives to the realistic approach, they provide an opportunity for addressing, unfolding and turning discrepancies between the game-provided and the participant experiences into fruitful foundations for learning. From this perspective, the game-provided experience becomes a tool for staging a reconstruction of the participants' conception of reality. Instead of seeing the alternatives to realism as fictional or not-realistic, they could be seen as opportunities for staging the game in a manner, that allowed participants to analyse their conception of reality, rather than having it constituted by the game. Such alternative understandings became visible when the discourse was challenged, or when attention was allowed to be turned away from the game and into the participants' practices.

FROM EDUTAINING TO STAGING

Through the analysis, the issues of *participational incentives*, on *how participants learn* and on *how game-provided knowledge is to be understood*, were addressed by describing how the three key issues currently are answered by *making the learning game fun*, by *making the learning game educative in itself through an embedded content to be explored*, and *understanding the game-provided insights as realistic representations on the subject*, allowing the analysis to provide an understanding of the effects that these answers have to learning games, as well as investigating what alternative conceptions and answers that were available. Through the exploration of the *EIS* simulation, alternative conceptions on the three issues could be seen in terms of *seeing participational incentives as a mean for staging problems and processes*, as *a discussion on application, staged by a game-based learning process*, and as *the staged presentation of perspectives for addressing the participant's reality*. In this analysis, emphasis has been moved from the learning game as something in itself, to the derived processes, *staged* by the interaction with the game-based activities. Such changes of emphasis does not describe a development within the use of learning games; rather it addresses some of the alternative approaches that from time to time become visible in the use of learning games.

As the analysis indicates, learning games still draw heavily on the discourses of edutainment, which constitutes an understanding that allows some game-based processes in taking place, while preventing others. As an alternative, a staging discourse is proposed in order to turn attention of the learning process towards the practical application of the provided perspectives. The

alternative approach has a downside, as it pretty much takes gaming out of learning games. While de-emphasising the gaming element, the design and design and deployment becomes less 'game-like' in terms of how games today are considered. While moving emphasis away from providing a fun alternative to teaching, while learning from realistic representations, the use of learning games to stage learning processes may seem far from the games they origin from. However, the staging discourse provides an opportunity for a whole new generation of learning games to arise, bearing less resemblance to current conceptions of learning games, but with a heavier emphasis on providing means and opportunities for learning than possible in the deployment of the edutainment discourse.

CONCLUSION

Seeking new ways of thinking about learning games proves to be a double-edged sword. As the analysis shows, current understandings of learning games works as a limitation to their use, whereas the abandonment of the current understandings opens the phenomenon to new meanings, objectives and applications, which may prove very advantageous to their educational purpose. On the other hand, by opening the understanding of learning games to meet such new opportunities, the current understanding of learning games is also challenged. As it is no longer confined by the discursive heritage from commercial gaming, such opening allows learning games to evolve away from its current heritage, and by that become less 'gamish' due to an invasion of discourses from other areas, especially from learning theory.

The currently accepted discourses on fun, educative content and realism concerns the game and its ability to edutain its participants, but in order to allow the game to extend its experience beyond itself, the learning game must be thought of in terms of staging itself for such extension, making it relevant to consider whether the learning game should attempt to draw reality into the game, or whether it should seek to draw the game into reality. While having argued for moving emphasis away from the game, a very subject dependent question remains on whether learning should be game-based at all. Despite its relevance, the question would precede the issue on how to extend the experience of learning games.

In this chapter, I have presented a number on why arguments on why learning games should not be fun, educative or realistic in order to point out the possibilities of thinking them otherwise, while putting current conceptions of learning games at stake.

NOTES

1. Realism refers here to the epistemological assumption that reality exists independent to our perception of it, and that it is possible to access (and represent) reality objectively

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Pau Waelder

An Enhanced Duelling Artefact: PainStation and the Role of Competition in Video Games

PainStation, an interactive art project developed since 2001 by German artists Volker Morawe and Tilman Reiff, introduces a new form of interaction and competition in computer games. It consists of a table console for two players, who confront each other in the first-generation arcade game *Pong* (1972), a simple tennis game in which each player must intercept a bouncing ball and send it back to the opponent. In order to play, the participants hold a controller with the right hand, while resting their left hand on a metallic panel. This hand will suffer from electroshocks, heat, or a whiplash every time the ball is not returned. The player could avoid the punishment by drawing back the hand, but this would mean losing the game, that is indeed a competition, in which each participant tries to beat the opponent not only by returning the ball but also by enduring the pain.

The artists describe the *PainStation* as an "Enhanced Duelling Artefact" (Morawe & Reiff, 2001, p. 1), a virtual face-off with physical consequences seen by many as the ultimate gaming experience. Indeed, the artwork has met with great success in numerous game conferences and media art festivals over the last years, receiving the Honorary Mention at the Ars Electronica Festival in Linz (2002) and the International Media Art Award at the ZKM Center in Karlsruhe (2003). At every event, the machine captivates the attendees and some even play for so long they have to be asked to stop due to too severe injuries. There's usually a crowd gathered around the two players, turning the game into what could be compared to a street fight, a boxing match or any other sort of duel. Competition in this game goes beyond the screen, involving the participants at a more personal (and physical) level. Their self-esteem is more deeply affected as they are not acting through an avatar and constrained by the abilities of a fictitious character, but putting their own physical endurance to test, and doing so in front of others. Yet, the experience is in most cases perceived as fun and addictive. The players do not seem intimidated, nor feel attacked, but on the contrary, they are eager to play again, particularly with friends – some trying to beat the highest score or improve their own performance.

The *PainStation* thus exemplifies a unique gaming experience, as it creates a competitive situation through an easily grasped game with the distinctiveness of an interactive device that causes pain, and which is played live and in front of onlookers. In the following sections I will review the aspects that contribute to explain the extraordinary response of most players to what has been described either as "the greatest arcade game this side of Pong" or "the stupidest thing I've ever seen" (see Appendix, §2 and 5).

ARTEFACT

Volker Morawe (1970) and Tilman Reiff (1971) created the first *PainStation* in 2001 while developing a project for the postgraduate program at the Academy of Media Arts in Cologne (Kunsthochschüle für Medien Köln). Their interest in games and technology led them to develop this console game with haptic feedback. The idea behind it was to enhance computer game play with physical experience and social intercourse. As the artists put it:

> In developing PainStation, the question arose as to how, first, the sensual contact, which is reduced in common computer games and, second, the principle of sociability, which is still only inherent in haptic games, can be integrated [...] not only should man and machine be linked, not only virtual opponents be fought (Leopoldseder and Schöpf, 2002, p. 102).

Instead of creating a new game, they reprogrammed one of the first and most influential titles in video game history, *Pong*, created by Nolan Bushnell in 1972. This choice was motivated, first, by the self-imposed prerequisite of using a game whose rules where self-explanatory, so that players would easily get involved in the interaction with the machine and with one another, which are the main objectives of the project. Second, choosing *Pong* entails first of all a tribute, a recognition of the history of video games (which have been largely considered just an entertainment for teenagers, with no cultural values and thus not worth having a history of its own), and also a challenge, the game being so straightforward that it is necessary to enhance it with a truly compelling form of interaction in order to make it interesting for an audience that is used to impressive graphic interfaces and immersive environments.

Morawe and Reiff developed an interaction that was not only physical but also painful, resulting in an artwork that grew in controversy as it met with growing approval among those who experienced it. The fact that the combination of one of the earliest videogames and a torturing device, humorously named after Sony's popular console, has become the ultimate gaming experience is in itself an incisive critique to the video game industry. Eric Zimmerman stresses this aspect of the *PainStation* as being more a critical artwork than a commercial game console: "Is the Painstation sadistic? Masochistic? Unethical? It is rare that digital games force us to ask these kinds of questions." (McGrath, 2002).

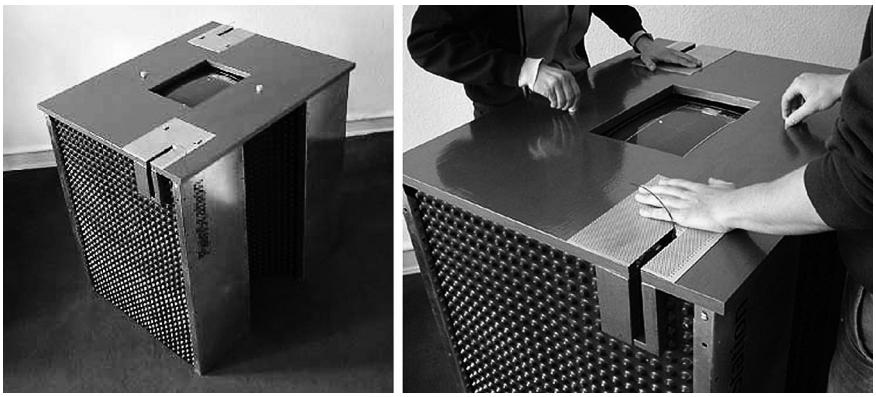

Figure 1. PainStation 1. General view and game play situation.

Even though it was conceived as an artwork, in the sense of being a unique piece that is meant to convey an idea beyond any functionality, the success of this first *PainStation* led the artists to design a second, upgraded version that would meet the requirements of the game industry and be massively produced. But the *PainStation* 2 (2003) did not follow on the footsteps of Atari's *Pong:* on the one hand, the threat of a lawsuit by Sony (due to the resemblance of the name and logotype of Morawe's and Reiff's creation and that of the PlayStation, owned by the Japanese firm), and on the other, the many possible actions that could be brought by users against a videogame that inflicts pain led the artists to drop the idea of commercializing the machine. Still, this second version (of which only five pieces were produced) has replaced the first prototype when exhibited in game conventions and media art exhibitions, featuring a series of improvements, including a (yet unused) coin slot.

Game play

In order to be able to discuss the experience of *PainStation* players, I will now describe in detail the process of game play. This description refers to the *PainStation 2*, which is the machine most players have tested, since it has been exhibited during the last three years.

Two players stand in opposite sides of the console, facing each other. Each player holds a knob with the right hand and places the left hand on a metallic panel with two buttons. These panels are the *Pain Execution Units* (PEU), equipped with several pain-inflicting devices: a lamp that radiates burning heat, electrodes that deliver electroshocks of varying intensity, and a whip made of exchangeable materials to produce different damage levels. These physical punishments will be inflicted on each player's hand. Once both players have their hands placed on the respective panels, they simultaneously press the buttons that start the game. The machine hums and produces several noises that sound subtly threatening. A message appears on the screen, informing the players that the machine can cause severe pain, describes the different punishments and states that the artists assume no liability for the physical

consequences of game play. Both players must press an "I agree" button in order to proceed to the game.

The game starts. On the screen, the familiar layout of *Pong* is displayed: on a black background, a tennis-like playfield is delimited by two horizontal lines and a vertical one, which divides the field in two. Each player controls a white bar, which acts as a tennis racket. By rotating the knob clockwise or counterclockwise, the bar moves up or down. The rules of the game are simple: intercept the ball to send it back to your opponent. In the original *Pong*, when the player misses the ball, the opponent scores one point. In *PainStation*, the first missed balls have no effect (this was decided by the artists in order to let players get used to the game), but after a few misses, a symbol appears on the side of the screen of the player who last missed the ball. This is a *Pain Inflictor Symbol* (PIS), which represents one of the three types of punishment. The next time the ball hits this symbol the player's hand will suffer the described punishment. At this point, the player must not retrieve the hand from the panel, because this would release the two buttons on the PEU and the game would stop. It is therefore necessary to withstand the pain in order to continue playing.

The game continues for as long as both players keep intercepting the ball or suffering the punishments. The artists enhanced the game on the virtual level also by adding "bonus" symbols that randomly appear on the screen. When the ball hits one of these items, the game can be affected in several ways: two balls appear instead of one, the ball moves faster, the bars are shrunk, punishments are applied for a longer period, all PIS turn to red (burning heat) or yellow (electroshocks), the directions are reversed, or even a flashlight is activated, temporarily blinding the players. Only one of these "bonus" icons, the cooling fan, does not make the game more difficult.

The console has its own 'personality': along with the background "humming" and the usual sound effects (indicating the bouncing of the ball and the appearance of PIS symbols or bonus items), there is a "PainStation Voice" that announces or comments the game with sentences such as: "try playing with two balls!" (when the double ball symbol appears) or "burn in hell!" (when all PIS symbols are turned to red), among other random comments.

Figure 2. PainStation 2. General view and detail of "Pain Execution Unit".

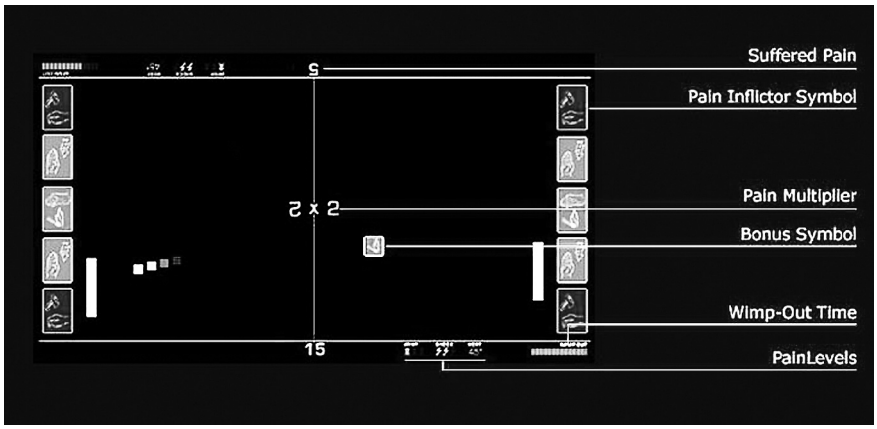

Figure 3. PainStation 2. Screen layout.

The only way to end the game is to take off the hand from the panel, which means abandoning. Until this happens, the players have to deal with increasing pain as the punishments inflict more and more severe damage to their hands. The totality of punishments inflicted on each player is scored in a "Suffered Pain" display: high scores are stored in the machine's memory, so that hardcore gamers can compete over the amount of pain they can withstand –the artists usually get emails asking them which is the current high score.

Players' reactions

As I stated above, the setting up of the *PainStation* in gaming events and media art exhibitions has met with great approval. Players are captivated by the game and many play until their hand bleeds, feeling almost proud to be wounded. A crowd usually gathers around the participants and follows the course of the game with sheer interest. According to the observations of T. Reiff (personal communication, August 24, 2006): "most of the players are laughing and enjoying the game, and they surely show off their wounds with some sort of pride. Most people prefer to watch before getting involved in the game. Usually when somebody plays he later on brings his friends, explains the game to them and then they play together". In Reiff's opinion, by average players are prominently male, between 18 and 35 years old, apparently not belonging to any particular social group. Many women also play this game, but those who test it are less inclined than men to try to beat the high score.

Hardcore players are particularly interesting in this case because, in general terms, the higher the score, the worse the wounds. These players engage in a feverish competition with their opponent, with themselves and with the community of players, by taking the current highest "Suffered Pain" score as the measure of their success. Some of them might play until they are told to stop because their wounds are too severe; others do not get to this point but are certainly eager to prove they can play long and stand a lot of pain. Reiff also recalls the case of a player who had really bad burns in his hand, and told

them he was unaware that the machine could cause so much damage. This illustrates the fact that, the *PainStation* being a game, players usually consider that nothing in it, including the pain, is really serious.

On the guestbook section of the artwork's website (see Appendix), the messages left by fans paint an eloquent picture of the players' experiences, their attitude towards the game and their perception of the artwork. The detractors mainly criticise the game as being "sick" and express their rejection towards the concept itself, because (as most of them imply) they have not played and are not willing to. Among the supporters, several types of reactions can be traced in the numerous posts. Most of them have directly experienced the game (and usually start their contribution with a sentence such as "I played in...", clearly stating this fact), but others are simply enthusiastic about the concept. In both cases, one of the main interests is to be able to buy the console, which means that it is perceived mainly as a product for home entertainment. Others do not want to buy it, but to build one (in this case some are willing to pay for the blueprint). Some suggest improvements to the machine, mostly to make the game more painful or even deadly (suggested additions include razor blades and a flamethrower). Then, the main concern is the high score: most players complain about not having been able to reach their "pain level" or proudly state that they have beaten the highest score (Appendix,§3, 4, 7 and 10). This happens usually with the concurrence of friends. Reiff's observations and the guestbook messages coincide in depicting an atmosphere of amusement among peers. Part of the fun is in watching the others when they cry in pain (Appendix, §8); also, a sort of cooperative play arises when the participants agree in enduring the pain to reach higher scores (Appendix, §7).

In sum, the players' reactions are mainly positive: they engage in an experience that is perceived as stimulating and fun, and evolves in a socially active environment, usually among friends. Pain is inserted in the context of the game and thus not taken as an aggression, but rather as part of a challenge that spurs the player's self-esteem. This bodily experience becomes later on the sign of belonging to a community, something to remember and share with others.

Figure 4. Player's reactions. Man playing and detail of wounded hand.

DUEL

Although the project description of the first *PainStation* opens with a 19th-Century etching of a duel with pistols, and the machine itself is defined as an "Enhanced Duelling Artefact", there is no further reference in the text to the correlations between the videogame and this traditional combat of honour. It is, in my opinion, important to further analyse the implications of applying the concept of duelling (and therefore competition) to this game in order to better understand the players' experiences. To this end, I propose here a brief review on the nature of games, particularly of those that imply a confrontation.

Johan Huizinga (1972) defined the game as a voluntary activity that is set out of real life, has no material interest, is performed in a particular space and time and is subject to its own order through a set of rules. Following Huizinga, Roger Caillois (1994) adds to this definition the condition that the outcome of the game play must be uncertain (in the sense that, for instance, players do not know in advance who will win). Caillois also contributes a classification of games in four main categories, of which I will only retain one for the purposes of this chapter: *agon*, the category of competition games, which also includes duelling. Caillois refers to these games as:

> ... a fight in which equal opportunities are created artificially so that the antagonists confront each other in ideal conditions, with the possibility of giving a precise and undisputable value to the triumph of the winner. [...] For each competitor, the driving force of the game is the desire for recognition of their excellence in a particular field. [...] The agon comes up as the pure form of personal merit and is used to manifest it. (Caillois, 1994, pp. 43-45. My translation from the Spanish version).

The *PainStation* matches both Huizinga's and Caillois' definitions, particularly in two aspects that help explain the positive reaction of the players. First, despite being painful, the game is totally voluntary because players can draw back the suffering hand at any moment, so that playing is perceived as a situation that they can control and it is only their will to win which keeps them enduring the pain. Second, as Caillois stresses, the game is set in equal opportunities, and the proper conditions are created so that there is undisputedly a winner and a loser. In this aspect, the machine is a key element as the mediator between two players. According to the rules of duelling, each participant has a *second*, a trusted friend who ensures that both parties are using the same weapons and that the conditions of the duel are fair. In this case, it is

Figure 5.
Player's reactions. Women playing.

the machine itself that becomes the *second* to both players, keeper of the *code duello*, theoretically ensuring that they are subject to the same type of punishment and that the rules of the game are not broken.

Figure 6. Player's reactions. Teenagers proudly showing their wounded hands.

The competitive situation experienced by the players is one of the main factors that make this game fun. A field research and an online survey study led by Vorderer, Hartmann and Klimt (2003) concludes that competitive elements determine the enjoyment in playing computer games, and that there is a preference for a social-competitive situation, in which the player contends against another user. With its clear rules and precise goal, this game creates a competitive structure that has no "grey areas", as can occur in many other social situations, and thus the players engage in a challenge that has a clear outcome: total victory or self-imposed defeat. Moreover, players are contending in front of an audience that plays an important part in the social dimension of the game. Caillois (1994, p. 128) stresses that "all competition is in itself a performance", pointing to the need for an audience to witness how one of the players defeats the other. Competition games lose motivation if they are not played in front of onlookers because it is their presence that spurs the participants' self-esteem, and also brings in a sense of community. Competition implies a shared activity that generates, according to Vernes (1967, p. 431), a community with the opponents and other fellow players. In *PainStation*, the two main elements that give sense to this community are, first, the experience of pain and its visible outcome in the form of a wound in the back of the left hand, and second, the "Suffered Pain" score. Photos of wounded hands are displayed on the "Hall of

Pain" section on the artwork's website (Morawe & Reiff, 2006), and according to the artists, some players are even proud of having the image of their hand posted in this gallery. Just like piercings or tatoos, the wound in the hand identifies that person as being a (regular- to hardcore-) *PainStation* player and therefore belonging to this particular group. As for the high scores, although they are not published on the website, they are a frequent issue in the player's comments posted on the guestbook. These scores introduce another aspect of the competitive structure: the competition not only against the opponent during game play but also against other players who might have endured more pain (thus reaching a higher score). It is interesting to point out how competitiveness takes the players to see a reward in repeatedly going through such an unpleasant sensation, as well as the fact that they find the measure of their own experience by comparing it with the experience of others.

AGGRESSION

For more than 15 years, the concern that video games with violent content might induce aggressive behaviour has been the subject of a constant debate among psychologists and media researchers. I think it is thus particularly pertinent to address this issue in the context of the *PainStation*, since it performs aggressions to the body of the user as an integral part of its game play. An overview of the most prominent research in this subject seems to conclude that no final asseveration has been made regarding the influence of videogames on aggressiveness: Anderson and Dill state that "there is presently no empirical evidence on whether playing a violent video game increases accessibility of aggressive thoughts" (Anderson & Dill, 2000, p. 773) but emphasize that videogames are in this regard potentially more dangerous than TV. One particularly interesting concern is that, as video games achieve a higher degree of realism, it is expected that aggressive emotions will be heightened: "the more realistic the violence, the more the player identifies with the aggressor. The more rewarding the video game, the greater potential for learning aggressive solutions to conflict situations." (Anderson & Dill, 2000, p. 788). Other studies have also considered the subject of reality by including experiments with head-mounted displays (Arriaga, Esteves, Carneiro, & Monteiro, 2006), but again no conclusion was reached. In any case, it would be logical to suppose that the *PainStation* is a videogame that critically induces violent behaviour and feelings of aggression, since its form of violence cannot be more realistic. Yet, the comments of both the artists and the players, as I pointed out before, paint a totally different picture. There seems to be no violent behaviour but rather simple amusement.

Most of the factors that lead to an explanation for the reactions of the *PainStation* players have been presented in the course of this text: first, the fact that participating in the game is voluntary, players being well aware of its nature because they have been watching others play before. Second and more important, the player can quit the game at any time with a simple gesture, and therefore is also aware that it is her own decision to keep playing. Third, the knowledge (or

belief) that the pain he is suffering is controlled and does not pose a real threat contributes to lower the possible feelings of aggressiveness the player might be experimenting. Fourth, the punishments are not applied arbitrarily, but as a result of bad performance, and therefore the player interprets that he is suffering from his own mistakes. Fifth, as I stated above, the will to beat the high score and the wounded hand as a sign of belonging to a group contribute to perceive the pain as somewhat positive, as part of a challenge and not a simple torture. Finally, the social environment in which the game takes place is a factor that particularly contributes to lower the players' aggressiveness. Williams and Clippinger (2002) conducted a field research examining the difference in frustration and aggression in game play after users encountered the computer as opponent and a proximate person as opponent. A non-violent game (Monopoly) was used in order to isolate the aggressiveness of the player from the function of game play. The researchers concluded that there was a significant difference in the level of aggression shown by the participants in the two situations, being the reaction against the computer much more aggressive than against another person, when this person is physically present. The social intercourse involved in the second situation led to lower feelings of hostility. The interface is thus key to the perception of aggressiveness: when playing against a computer, the user can't empathize with the machine, he does not know what it is thinking and can't evaluate its abilities or know if it is playing fair, and consequently feels in an unfavourable position. When playing against another person, both participants perceive game play as a peer-to-peer situation, the computer being a mediator that levels their skills or at least constraints them to what is needed in the game. Casual conversation and body expression give the players additional information that contributes to modulate aggression (the attitude of the opponent tells the player whether the game play is being taken seriously or not, for instance). The comments posted on the guestbook of the artwork's website as well as the artists' observations indicate that usually players compete against friends, and that the situation is perceived as amusing.

The artists recall only one situation in which a player developed an aggressive behaviour (Reiff, personal communication, October 6, 2004): it was the case of a boxer who had come to the game convention right after being in a fight. As he received the first electroshocks, he began to slam his fist on the machine and later on angrily asked who had built the artefact. Both artists silently left the place, not returning until the boxer had calmed down. But this is of course a particular case that can only prove, as most research in this field does, that violent individuals tend to violent behaviour.

PAIN

The *PainStation* is usually criticised as being a game for masochists. It could seem obvious to refer to masochism when someone voluntarily submits to receiving pain, particularly if it is in the context of a leisure activity; but in this case the players' motivations have nothing to do with a psychiatric disorder. In the previous section, I briefly described the factors explaining the players'

low levels of aggression, or even their lack of it, despite the violent nature of the punishments they are suffering. These factors also contribute to explaining that the pain felt by the participants is not experienced in the sense of torture, domination or humiliation, but as an unpleasant sensation that must be overcome to prove self-efficacy. According to Westen (1987) our behaviour is determined by affects, which define the course of action depending on how a situation conflicts with an ideal state. For PainStation players, the ideal state or the goal is to defeat the opponent and, as suffering pain is necessary to achieve this goal, they do not try to avoid it. Therefore, players do not willingly undergo the painful punishments, but rather choose suffering instead of abandoning. This is, in itself, a fundamental distinction; but there is also the question of how the sensation that we define as pain is actually perceived.

The perception of pain can be affected by several psychological and cognitive variables. Janal (1996) examined what he defined as stoicism in recreational runners: the fact that after exercising they report being less affected by pain, although their tolerance remains the same. He concluded that: "pain is reported to be lessened during and after exercise, but tolerance is unaffected. There is some evidence to suggest that this effect is mediated by an opioid anti-nociceptive system" (Janal, 1996, p. 379). Expectations also modulate the perception of pain. Koyama, McHaffie, Laurienti and Coghill confirmed that "positive expectations [...] produce a reduction in perceived pain (28.4%) that rivals the effects of a clearly analgesic dose of morphine (0,08 mg/kg of body weight, an ~25% reduction in pain)" (Koyama *et al.*, 2005, p. 12955). These examples illustrate the fact that the subjective perception of pain can be different when performing a voluntary activity that is related to it (as is the case of runners) and with positive expectations. This does not mean that PainStation players are not feeling any pain, but rather that the pain they are feeling does not affect them in the same way it would if the punishments were applied in a different situation. This, combined with a context that rewards enduring pain with higher scores and sometimes defeating the opponent, describes a situation that is totally different from experimenting algolagnia or the sexual fantasies of masochists.

CONCLUSIONS

Two students, equipped with metallic protections for the chest, neck, eyes and nose, are put face to face very close to one another and armed with swords. As the referee shouts "Los!", the duellists engage in a fight whose purpose is to slash or cut any of the uncovered parts of the opponent's head (skull, forehead, ears, in some cases cheeks) and leave him scarred for life. The fighters must not show any fear or pain, because this would mean dishonour. Known as academic fencing or Mensur, this sort of duel has been practiced by students belonging to specific brotherhoods (or corps) in Germany, Austria and Switzerland during the last two hundred years (Green, 2004).

Mensur illustrates the fact that the need to engage in a competitive situation, which involves physical punishment in a setting controlled by rules, is

anything but new. The *PainStation* itself is based upon a card game for children played in Germany, called *Folter Mau-Mau*, in which the loser receives several types of punishments in the hand according to the cards kept when the game ends. On the guestbook of the artwork's website, "Lil'rich" (Appendix, §9) explains that the machine inspired them to create a "rudimentary version" of the game in which two players slap each other's breast until one has to pull out. Many other examples can be found in children's games around the world, and lately in media art projects that, as the *PainStation*, have dealt with other forms of interaction in the context of games, such as *Legshocker*, also by Morawe and Reiff, or *Tekken Torture*, by the artists collective C-Level. In all these games, pain is integrated as a threat and a way to physically stimulate the players and put them in a state of alert that brings forth the consciousness of their own bodies. But also as a way to put at stake something that is really important for the player and heightens the value of the competition. As the artists put it: "victory satisfies more if won under pain" (Morawe & Reiff, 2001, p. 2).

Figure 7. Audience gathering around the players

The need to compete is inherent to every person, and it is the purpose of the game to provide a socially accepted scenario in which this necessity can be satisfied. Among the bio-psychological explanations of the game, R. Caillois includes the following: the release of an excess of vital energy, the desire to be involved in a competition in order to affirm one's pre-eminence and the sublimation of instincts to which society refuses a direct satisfaction (Caillois, 1950, p. 200). The *PainStation* has met with such success because it complies

with all these conditions, and thus provides hints to understanding the way in which future forms of computer games might develop. Not in causing pain and wounds, because this was intended as a way to force a reaction that would lead to critical thinking (yet it met with maybe too much approval), but certainly in inserting haptic stimulation, new ways of interaction and a real social intercourse.

Players want to engage in a game that does not only involve virtual characters and fantastic settings, but puts them back in touch with their bodies, challenges their endurance and gives them the chance to play face to face (and not side by side, facing a screen) with another person. The next "enhanced duelling artefacts" will certainly develop creative ways to provide this new sort of video game.

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APPENDIX

Selected entries from the guestbook on the official website of the PainStation (http://www.painstation.de/new/guestbook.php). Spelling mistakes have been kept in order to preserve the style of the original texts.

§1: "If i find a painstation in manchester ill b straight on it just 2 c how far i could get and to c how much pain i could handle – quayan (key anne), 07/1/2006"

§2: "Painstation is the greatest arcade game this side of pong. – Sco, 05/31/2006"

§3: "You're ps is great! But one thing... Can you make him compateble for small hands? Because i've got small hands, I could keep the pressure right and lost because of that, my painlevel wasn't reached yet :(For the rest super! Come soon to Einhoven again! (hopefully adepted to small hands) – Lydia, 05/15/2006"

§4:"OH! MEIN! GOTT!!!! Wie viel kostet das Teil und wo kann man es sich bestellen? Ich will eine. SOFORT! Hab vorhin mit meinen Bandkollegen in Stuttgart gespielt. Beim ersten Spiel war ich geschockt (im wahrsten Sinne des Wortes). Verloren.... Aber ich hab den Highscore geknackt ^^ und das ohne cheaten. Bin echt süchtig nach dem Teil. Ich will eine. Wirklich... Und zur not bau ich mir selber eine. Wieviel kostet der Bauplan? – therealpanse, 03/30/2006"

§5: "This must be the stupidest thing I've ever seen... – random guy, 03/18/2006"

§6: "Absolutely fucking awesome. I wish I'd thought of it. Maybe for the more hardcore people like me, you could fit it with razorblades or some sort of barbs on the ends of the whips? Maybe a flamethrower somewhere? Chirst, if I could buy one I would..... – random american bastard, 03/16/2006"

§7: "Greatest gaming console the world has ever known. Me and two of my friends visited London last summer after our graduation. We ended up going to the V&A's TOUCH exibit where we thankfully found the original PainStation. We couldn't or at least I couldn't get enough of plaing the game, I believed that I stood there playing various spectators for over two hours. And I ended up having the high score which I believe was in the 205 range, the score would've been higher unfortunatly my jackarse of a friend couldn't hold on. I think that my high score was on their until the exibit ended, the score was either under INM, DIB or IAN. Either way amazingly great gameplay or should I say gamepain. I just have two questions about this game. When will we see this in the U.S. and when will we see the PSP or Pain Station Portable? Thanks for a great addiction and a scar of remembrance. – Ian, 03/15/2006"

§8: "Just played Painstation in Abertay University Dundee!! It ROCKS!!!! Even when the pain becomes almost unbearable I kept going back for just one more game, just to see the look on my friends faces as I try to beat them!! – enigamic, 03/1/2006"

§9: "After finding painstaion one on the net last year, inspiration was provided for a more rudimentry version that you can play in countries like New Zealand where you will not be able to play painstation, called Slaps. One hand behind the back, each player takes turns to slap the others opposite breast until one has to pull out. simple but effective, great spectator sport. A little deep heat can be added to increase pain. A female version can be played with horizontal slaps to the stomach. – Lil'rich, 08/23/2004"

§10: "played in st. gallen/CH. got addicted. want to play again... only 'bout 280 points before the other guy gave up... wasn't real pain yet. – stefan, 06/4/2004"

PART THREE

Interfaces of Play

INTRODUCTION TO PART THREE

Computer games and productivity software, such as office programs, share quite a few qualities, as they operate on similar technological frameworks. Usability and other concerns related to human-computer interaction (HCI) have for a long time been an integral part of commercial software development. The computer game industry has also adopted these practices; International Game Developers' Association (IGDA) has a special interest group for game accessibility and big game developers have their in-house usability teams employing a variety of methods to address usability concerns during game development. Knowledge of human information processing and ergonomics, for instance, is as applicable to games as it is to other software applications.

Games also have their unique qualities. As Jørgensen has suggested, it is important that games are easy to learn, but difficult to master, although this "reflects and contrasts conventional usability evidence easy to learn and easy to master" (2004, p. 396). While productivity software is designed to facilitate achieving a certain task with maximum ease of use, the intended difficulty, as Jørgensen puts it, contrives for the interface not to always be as simple and intuitive as possible. Actually, learning, possibly by trial and error, what can be done with a game's interface, is often an essential part of the playing experience.

Salen and Zimmerman (2004, p. 332) have, with reference to Csikszentmihalyi (1991), identified playing as an autotelic activity, meaning that it is not carried out for the sake of a potential future reward, but rather for the sake of the activity itself. Computer games, like many other software products, contain tools to facilitate achieving tasks, but these tools come with motivations for, and contexts of, their use. In other words, games provide not only a means to an end, but also the end itself. For users of productivity software, any particular qualities of their experiences are added values on the way to their achievements, whereas players, in general, are trying to succeed in order to have certain kinds of experience.[1] These experiences, whether they are for

1 An interesting debate is taking place concerning the idea of power gaming (see e.g. Taylor 2006) and the forms of professional and laborious playing (see e.g. Kücklich 2005), which both challenge the "self-sufficiency" of a game presented in this introduction. However, these issues are not further elaborated herein.

example, entertaining, educative or enlightening, hold in themselves significance for the players. Thus, if computer games have a task they're designed to fulfil, it is the task of conveying an experience for the player. Sometimes it may make sense to see players as tool users who often want to get a job done quickly and easily, but it is also important to remember that they are, after all, employed by the games. Not until recently has the value of player's achievements in computer games been exchangeable for a real-world value other than social esteem via eBay and similar services.

Conveying a specific kind of experience to the player is not necessarily an easy task. Game designers have limited powers; as the earlier parts of this book have demonstrated, the designer-made product is not the only factor affecting the player's experience. As Hassenzahl (2004, p. 47) notes, designers can create possibilities, not certainties. Apart from game design, producing a game also requires software engineering, audiovisual artistry and interaction design to name a few. The theoretical limits of the computer game medium can be seen as being comprised of the level of knowledge of all disciplines, arts and practices involved. Vice versa, the advancements in these fields contribute new techniques to be exploited. In the real world, however, the market often dictates how innovations get implemented.

A mass-market gesture control device may have existed as an enchanting yet impracticable idea for many years, but not before it was possible to pack together an accelerometer, image censor and Bluetooth radio, manufacture such package cheaply enough and infuse the players with the belief that gestural control for games is a good idea, were we able to buy a Wii Remote at its current price of 30€. A mere piece of technology does not necessarily make much of a difference, yet when game designs make use of its capabilities, the possibilities for experiences start to appear.

A contemporary mainstream game, whose production costs may have exceeded those of a minor movie release, is targeted to a group of potential players. Naturally, different games cater for different audiences. Developers of a turn-based hex strategy game may emphasize game mechanics over an audiovisual outlook, whereas the developers of a sequel to an epic fantasy game series make sure that the games' plot fits the lore of the series. Regarding Wii Remote; pictures of happy people of all ages dressed in casual clothes were presented in the media long before the product was released, which set expectations regarding the style of games to be released with the new console.

What is to be gained from these observations is the idea of player experience as an experience with a product that is engineered under certain technological restrictions, optimized for meeting certain requirements (such as expectations of a particular audience) and designed to provide possibilities for certain kinds of experiences. The third part of the book, Interfaces of Play, is centred on these themes.

The third part begins with Amyris Fernandez's chapter, which discusses the enjoyment of playing a computer game from a multidisciplinary viewpoint drawing from the traditions of communication studies, usability research and computer game studies. Her aim is to model players' enjoyment in order to

allow game designers to provide more enjoyable experiences for the players. She presents a model on fun experience with games, detailing the interconnections between elements involved in the experience of digital game play.

Shaowen Bardzell looks at the interaction taking place between the game and the player from the viewpoint of usability. She discusses how games create and represent meanings through and within their user interfaces. To facilitate her analysis she defines a concept of an interaction cue, a sign that communicates possibilities of interaction to the player. Her chapter combines HCI and semiotics with computer game studies. Based on a study of 29 different games and almost 400 interaction cues, she presents a taxonomy of interface elements in computer games. The taxonomy has a variety of possible usages in game design, analysis and criticism.

Clara Fernández-Vara discusses the interfaces of adventure games, a genre of games which emphasize storytelling over complex forms of real-time interaction. Building on studies on interactive fiction, she looks at the development of the interfaces of adventure games, namely the possibilities the interfaces allow for direct manipulation of in-game objects. By discussing examples ranging from games, with which the player interacts by typing sentences in plain English, to games with gestural interfaces of the future, she observes how the increase in the possibilities for direct manipulation can affect the player's experience.

In their chapter, João Bernardes, Romero Tori, Ricardo Nakamura, Daniel Calife and Alexandre Tomoyose present an extensive review of augmented reality (AR) games that demonstrate the blurry border between the game and the real world in a very practical manner. The authors identify the main concepts related to AR and discuss the impact AR has on the future of digital gaming. Their initial three-type classification of AR games, founded on the need for physical space, is broken down further into subcategories based on the metaphors with which the game mechanics can be described.

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Amyris Fernandez

Fun Experience with Digital Games: A Model Proposition

Game designers work is to craft enjoyable digital games, products designed to provide a pleasurable experience for the duration of the game play. If they fail in this task, the game is immediately dismissed for other game titles, or other forms of entertainment. As the gaming industry matures it resembles more to Hollywood. The typical video game now costs upwards of $10 million to produce. With the stakes so high, few companies can afford to fail and innovation becomes a risky strategy (Entertainment Software Association 2005). In order to improve digital games during the development process, academics and practitioners alike are using a range of methods to assess user experience with games.

Games are experience providers, and game developers need tools to better understand user experience of the products they created. McCarthy and Wright (2004) state that experience is a fuzzy concept, because it is reflexive and is ever-present, and that experience derives from feelings, emotions, and values that populate responsive relations with others and products. One have to consider that every experience has the unique perspective of the person involve, because perception is created during the consummation of the experience. One also must consider that game designers aim to deliver the best experience possible to users by making the best possible choices on every component of the game, form software to plot. However, they are making choices based on their previous knowledge of what makes a product successful to a given target audience, which does not guarantee that they will be able to actually deliver what the user expects.

When people play games on the computer screen or cell phone, trying to make points or kill a virtual beast, they are in the search of fun, which is one way to enjoy the experience, and it is what makes it useful and enjoyable for that person at that time. First of all, nobody needs to play any given game, it is a choice. Gamers have other entertainment choices like any of us: TV, radio, magazines, other person, a pet, the Internet, look out of the window, go walk, but they prefer to play.

It is necessary to acknowledge that a good game is the one that leads to some degree of enjoyment, even when the game is silly; poorly designed

or easy to master one can have fun and enjoy the experience (Shneiderman, 2004). Of course, in common speech pleasure, enjoyment and fun are almost synonymous and enjoyment, pleasure, fun and attraction are often used interchangeably. Typical of a relatively new area of investigation is the lack of an agreed set of terms. In order to overcome that, I will use Blythe and Hassenzahl's (2004) approach to enjoyment, a broad category that includes fun and pleasure on activities. John Dewey argued that all emotions grounded in particular context of experience: "There is no such thing as the emotion of fear, hate, and love. The unique character of experienced events and situations impregnates the emotion that is evoked" (Dewey, 2005).

Blythe and Hassenzahl's (2004) also state that enjoyment doesn't exist in and of itself. It is a relationship between ongoing activities and states of mind that creates the opportunity to have different degrees of enjoyment of a given experience. Thus, enjoyment is never guaranteed. Every time a person decides to play a game rather than watch TV or talk to friends, academics and practitioners are dealing with a unique situation: the person's current goals, previous knowledge and experiences, motivations, the behavior domain, and applicable social norms. Activities associated with enjoyment offer potentials for enjoyment rather than enjoyment itself, and enjoyment degree depends on person judgment of the quality of experience.

In order to experience fun, the game experience needs to shift our focus towards the game, instead of our self-definition, our concerns, and our problems, distracting us from the constant clamor of the internal dialogue. Games entertain; they divert people from their daily tasks or current status. Fun is important because of its ability to distract for a small period and with superficiality that satisfies an important underlying psychological need in that moment. On the other hand, pleasure lasts longer, and it may not even be spontaneous. It happens when people are devoted to an object or activity. It is possible to argue that gamers who spend a great deal of time devoted to a game are trying to make sense of them during the play, and it happens because they feel pleasure by doing so. It is possible to understand that there are connotational and experiential differences between of fun and pleasure. This is not to suggest that pleasure is more worthy pursuit than fun, it is rather an attempt to delineate different but equally important aspects of enjoyment. Actually, it refers to a different degree of enjoyment, and consequently, depends on the individual overall judgment of any given game experience they have.

The main question is how to assess this experience and how to measure the difference between expectations and actual experience, looking at each element as a part that can help or impede the user to enjoy the moment.

PREVIOUS MODELS OF EXPERIENCE ASSESSMENT IN GAMES

Previous models to assess game players enjoyment during the game relies on flow (Sweester & Wyeth, 2005), other models are looking for what determines the quality of a video game (Fabricatore, Nussbaum & Rosas, 2002), or intuitively add psychology techniques to usability methods, to assess what is desirable in a

game in consumer terms (Pagulayan, Steury, Fulton, & Romero, 2004). Earlier models (Hassenzahl, 2004; Jordan, 2000; Logan, 1994) of user experience with a HCI approach define key elements of user experience and their functional relation, but do not provide ways to assess those experiences after they take place.

Flow is a widely accepted model of enjoyment that includes eight elements that encompass the various game heuristics from the literature. To determine how elements of flow manifest themselves in computer games, Sweester and Wyeth (2005) conducted an extensive review on the literature of usability and user experience in games. The result was the *GameFlow* model, an attempt to put together various heuristics into a concise model of enjoyment, which consists of eight core elements – concentration, challenge, skills, control, clear goals, feedback, immersion, and social interaction.

Flow has been proved to be an elusive construct to define. While Csikzentmihalyi (1997) wrote extensively on the subject over the past 20 years, definitions provided in these sources, and by other researchers, always lack consistency and comprehensiveness. Existing definitions of flow are constructed in terms of a wide variety of constructs an individual tends to experience in the flow state. Some definitions include constructs that define or cause flow, while others specify outcomes that are experienced as a result of being in flow state (Novak, Hoffman, & Yung, 2000). Although the GameFlow model is a very interesting approach to assess game enjoyment, a key difficulty with this is the lack of consistency in operational definitions of flow constructs.

The qualitative design model, developed by Fabricatore, Nussbaum and Rosas (2002) elicit players' preferences, and describes the main elements that, according to players determine the quality of an action video game. The research is a qualitative approach and results in a series of specifications that focus on end-user needs. In order to conduct the research, they adopted the grounded theory method that allows working on an emerging theory. In this iterative process, researchers' theory is constantly revised and eventually modified as new patterns emerge from the analysis of data. Therefore, the methodology provides the means to shape a qualitative model based on empirical data gathered during playing sessions. In those sessions, players verbalized what determines quality in a game. In my point of view, two problems come from this methodology and model. First, it is necessary to agree that there are many different sorts of digital games, which makes one game genre model useless for other games genres. Second, in order to create a model for a given game genre many operational issues arise: number of participants, recruiting, time, budget, and modeling. Since the main outcome of this work is a set of design guidelines for game genre, I believe that this work is more a set of heuristics than a model *per se*.

Other important contribution comes from Pagulayan and team (2004). They extended the use of current usability methodologies in order to address some of the unique issues one can find in games. This methodology adapts some experimental psychology knowledge in order to improve user-centered design methods. On presenting a series of case studies, it is easy to notice that what they are really doing is comparing user needs and desires with designer expectations about the game outcomes, and then fixing problems based on

this difference. Thus, every test and game development becomes a different case study, because it uses a different approach to point to problems. Because this approach is empirical, the result of the methodology relies too much on the practitioner experience and game developer team communication skills, making it difficult to reproduce their work, and repeat success stories of helping game designer improve their products.

There are some models of user experience with a HCI approach; some of them are very simplistic (Jordan, 2000; Logan, 1994). Mark Hassenzahl (2004) proposed a more complex model that tries to define key elements of user experience and their functional relation. The model addresses (a) the subjective nature of experience *per se*, (b) perception of a product, (c) emotional responses to products in (d) varying situations. The main contribution of this work is that it recognizes that the designer perspective is intended. It implies that there is no guarantee that the user will actually perceive and appreciate the product the way designers wanted it to be perceived and appreciated. The second most important statement is about the user experience. When users start using a product, he says, a process is triggered. This process is about how people construct an opinion about a product based on the particular combination of product characteristics, their personal standards and expectations, sometimes based on past experiences, and in a particular situation. Depending on the situation, emotional and behavioral consequences are completely different.

Because product interaction is a complex cognitive structure that evokes memories and symbolic values, Hassenzahl model distinguishes the product attributes in two categories: (1) pragmatic, referring to manipulation and fulfillment of individual's behavioral goals, and (2) hedonic, referring to attributes that stimulate, have some identification with individuals and provoke memories in them. Hedonic attributes emphasize individuals' psychological well-being. However, the model does not relate constructs with game experience in mind. It is a more broad view of user relationship with technological products.

Digital games experience research needs to consider the impact of user profile, product awareness and user expectations on the overall experience, because it transforms the game perception and the play experience. In my model pragmatic and hedonic attributes are constructs that depend on product characteristics that game designers can manipulate and improve, in order to induce to some degree of psychological well-being. All previous models disregard the context of usage that may take attention and memory away from the game, and the influence marketing awareness towards the product that raises the user expectations (MacInnis & Jaworski, 1989). These are just some of the reasons a new processing model is being offered to assess and understand user experience with digital games.

MODEL PROPOSITION

The model proposition is based on knowledge and methods coming from different two different areas: Human-Computer Interaction and the Communication field of study. It makes the Conceptual Model of Digital Games

Messages Processing an integrative model, that is sustained by tree main ideas: 1) *Time:* experience occurs during a certain period of time, comprised by the time before it really happens, during the game play, and after the game, 2) *Cause:* there are many elements that build the experience and they act on each other, altering the result to various degrees of fun, including not having fun at all, and 3) *Result:* fun is the main result of this experience, but depends on how the elements act on each other. As figure 1. illustrates, the basic components of the Game Experience Model.

This model aims to:

1. Identify and describe the elements involved in the digital game experience;
2. Identify and analyze the relationship among those elements, and indicate how they influence each other.

The Model includes: 1) *Antecedents:* a previous state where user expectations exist, and depend on user profile, 2) *Processing:* the game play, where the player experiences the product, and 3) *Consequences:* the results of this experience, when the user may have changed her mind in some way about the game due to the game play experience.

In the next section is a description of each part and elements of the model.

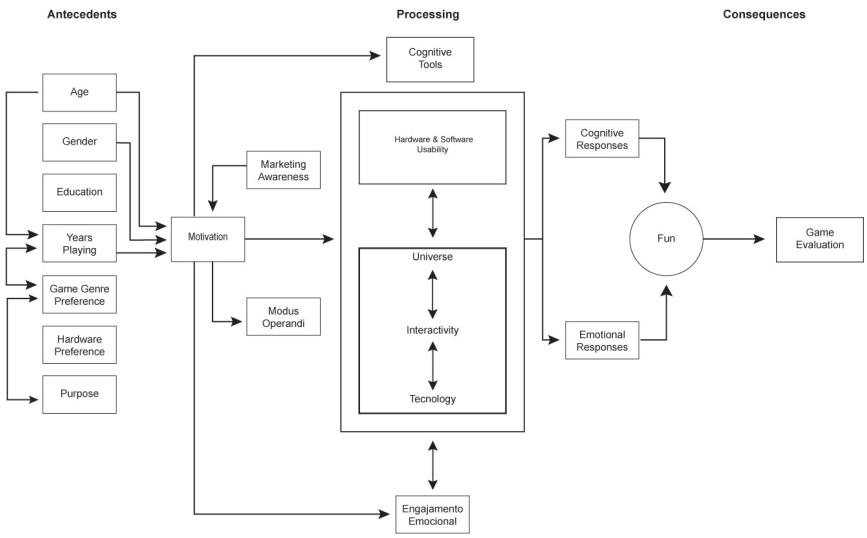

Figure 1. Fun Experience in Digital Games: Model Proposition

Antecedents

The antecedent's part of the models takes in consideration the game audience before they begin game play because the user profile influences their choices about which game to play and where they play it (Norman, 2002). In this

model, user profile comprises: 1) *User demographics* (age, gender, education), 2) *Internet and handheld related issues* (why, where, what, how the player uses these), and 3) *Game activity* (previous experiences, hardware preferences, years playing digital games, frequency, preference in socialization level, genre preference, and purpose).

User profiles give an insight about the game player as a consumer. Traditional demographic traits such as age, sex, education levels, and income no longer help us predict consumer buying habits, because it is no longer possible to infer habits or predict behavior from age and gender, for example. Non demographic traits such as values, tastes, and preferences are weak on predicting what any of these people are likely to purchase (Yankelovich & Meer, 2006). The model acknowledges that by correctly identifying groups that were potentially receptive to a particular game genre, or have interaction preferences in terms of hardware, socialization, and purposes, one can better understand the relationship of consumers to a specific game and game play appreciation.

Game genre preference is a very sensitive topic, because game genre definition varies depending on the source, and games are usually classified in arbitrary, contradictory or overlapping ways, mainly because of marketing purposes (Elverdam & Aarseth, 2005). In order to increase understanding I will use a set of genre categories comprised of: action, adventure, educational, emulator, fighting, puzzle, racing, role playing, shooter, simulator, sports, strategy, traditional, serious, massive multiplayer (All Game Guide, 2006). Game genre and purpose add attributes to the user profile that help understand the way a game player makes decisions.

The model considers that user purpose and motivation are different constructs. Literature review shows that the two words have been used as synonyms, but some distinction is necessary. Purpose is an outside aim or goal that defines product requirements to provide social or aesthetic utility to express one's actual or ideal self-image, role position, or feelings toward group members (Park & McClung, 1986; Park & Mittal, 1985; Park & Young, 1986). Motivation is a psychological state, and reflects the desire to consume products for their cognitive (Cacciopo, Petty, & Morris, 1983)or sensory stimulation (Hirschman & Holbrook, 1982). Thus, motivation is related to factors that arouse, maintain and channel behavior towards a goal, moderating the link between product exposure or game play, and the game appreciation process (Batra, 1986; Greenwald & Leavitt, 1984; Mitchell, 1981; Petty & Cacciopo, 1986). Though, the model takes in consideration both concepts. Purpose is part of antecedents' part of the model, and motivation is a mediator between the emotional and cognitive responses.

Because game players tend to transition either from a playful behavior to a more serious one, and it interferes with the goal-directness, the model uses the *Modus Operandi* concept. Murgatroyd (1982) conceptualised goal-directness as a continuum ranging from "Telic" to "Paratelic," where telic refers to high goal directness that I called "serious" and paratelic refers to low goal-directness, which I called "playful." The telic mode tends to be more serious minded and focused on the future, while individuals in paratelic mode tend to be more playful, light hearted, orienting actions towards the present. Rodgers and Thorson

(2000) believe that a more serious, goal-oriented mode might translate into a greater cognitive effort being placed on reaching a goal, which is a futuristic outlook, and a lesser cognitive effort being devoted to other tasks such as interacting with others and paying attention to context distractions such as noise. On the other hand, users on a paratelic mode may be more curious, and apt to explore the virtual environment. These considerations make it necessary to understand if motivation triggers cognitive tools and emotional engagement.

The antecedents' part of the model intends to capture the elements that build game player choices and lead to a certain behavior during a game play as follows.

Processing

Processing refers to the period when the player is actually engaged in the task. Processing depends on motivation, that affects the direction of the attention and the amount of memory allocated to the tasks. According to Bettman (1979), motivation affects both direction and intensity of behavior. Consistent with this notion, advertisement processing models propose that motivation affects two dimensions of processing: direction of attention and intensity of processing (Mitchell, 1981; Petty & Cacciopo, 1986).

Attention, defined as the general distribution of mental activity to the tasks being performed by the individual (Moates & Schumacher, 1980), reflects both that which receives mental activity (direction) and the duration of the focus. As a limited cognitive resource (Mitchell, 1983; Norman & Bobrow, 1975), attention can be allocated in varying degrees to a primary task or to secondary ones such as daydreaming, conversation, or other environment stimuli. During this period, as the perceived degree of relevance of a game task outweighs the perceived degree of relevance of a secondary task, motivation to process game content increases. As a result, greater attention is allocated to the game task in detriment of secondary tasks (Celsi & Olson, 1988). The selective aspect of attention is under conscious control and is directed toward stimuli of greater relevance. However, it is also recognized that stimuli must contain properties that elicit attention (Berlyne, 1960). As attention to the stimulus increases, greater amounts of working memory may be allocated to process information. The term "processing capacity" intends to reflect the amount of working memory allocated to process stimuli. In earlier models, focus (in our terms "attention") and the extent of processing (in our terms "capacity") were both considered under the generic designation of "attention" (Norman & Bobrow, 1975).

Not only does the engagement with the game require the use of cognitive tools, it simultaneously elicits emotions on the user. The emotional engagement is usually expressed through a combination of verbal and facial expressions and gestures (Sundström, Stahl, & Höök, 2005). However, there are emotions that provoke a low level of arousal and valence (Russell, 1980), such as feeling gloomy or bored, making it hard for observers to gain access to gamers' emotional states (Mandryk, Atkins, & Inkpen, 2006). According to Russell (2003) emotional states are at the core of human emotional experience, and affect the

experience results. Emotions are also acknowledged as factors that influence the attitude towards a brand, and hence it is logical to think that emotions influence the attitude towards a product (MacInnis & Jaworski, 1989).

The game play experience happens through the games pragmatic and hedonic' attributes. The model assesses pragmatic attributes through game interface and device interface usability. It is well known that low usability of any sort of interface limits the user's capacity to reach goals trough task completion, and lowers user satisfaction. Hedonic attributes are comprised of the game's universe, interactivity, and technology to promote aesthetic pleasure (Chao, 2004). The universe constructs are: (1) the plot, its development and possible outcomes, (2) boundaries or rules, including rules for game economics, (3) characters, because they will evoke players' self or memories, (4) ability to "make believe", referring to the level of detail with which the whole game universe is developed and presented to the game user in the virtual environment. Some may call it degree of realism, but since I are talking about a fantasy, it doesn't seem right to me.

Interactivity is a group of features that trigger user actions and reactions, and are related to: (1) the game challenge in terms of objective (get the black belt in martial arts, for example), (2) pace or rhythm in which the game player achieves short term goals, (3) responsiveness: how the game reacts to players' actions, including saving past moves.

Technology attributes are those that rely on technological limits or advances to perform, and are comprised of: (1) technical issues- correctness (the functions are adapted to the tasks the users are doing), availability (the functions are available in a simple manner), reliability, security & integrity (functions perform as expected, information is correct, saving and retrieval of information is correct), robustness (the system is capable of handling technical and user-generated errors), (2) multimedia – graphics, sound and camera angle, (3) degree of realism with which an action is presented to the user, for instance, if the game player needs to use a gun, the gun performance must be as close to real life performance as possible (Fullerton, Swain, & Hoffman, 2004).

Consequences

MacInnis and Jaworski (1989) propose that responses to ads are cognitive and emotional. Cognitive responses are thoughts, including inferences, during exposure. Emotional responses are feelings elicited during ad exposure. The model assumes that similar phenomena happens during game exposure, thus, game appreciation depends on the emotional engagement and cognitive tools usage level. The model considers Fun as a result of game experience through hedonic and pragmatic game attributes, mediated by cognitive and emotional tools.

RELATIVE ADVANTAGES OF THE MODEL

It is my contention that the model outlined here takes the first steps in linking HCI and communication message processing theories. The model claims that there are additional structural features in the game experience as compared

with traditional usability inspection methods. In addition, there are different expectations about games regarding software usability. Because people have many different motivations and needs to fulfill with the experience of games and because each game genre is more apt to deliver what is in the user's motivations, those motives are critically important to understand how users needs and values modify the way they interpret an experience, and what they expect from it.

In order to improve results in the future I suggest creating an experiment with one game genre, and recruiting players that prefer the game selected for the test. It is also important do conceptualize and discriminate what is fun, and how it can be measured. By doing so, it will be possible to understand different degrees of fun or game appreciation.

I expect the model to help academics and practitioners to achieve a better understanding of the game experience.

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Shaowen Bardzell

Systems of Signs and Affordances: Interaction Cues in 3D Games

INTRODUCTION

Video game play is a species of human-computer interaction: whether it occurs between a player and a game (environment, rules, story, etc.), or among players, interface-mediated interaction is the basic locus of video game play. Interaction design, hence, plays a major role in video games; at the same time, it forces us to conceptualize games as interactive systems – systems designed for fun, entertainment, and discovery rather than professional productivity to be sure – but nonetheless computer systems with their own issues of usability, aesthetics, and satisfaction.

During game play, players take thousands of actions, both great and small. During this time, player perception of the state of the game becomes crucial, as the player uses information gathered to arrive at an awareness and interpretation of a given situation, which in turn guides further progress/activity. Video game usability, in part, covers the extent to which a game successfully supports this action-guiding awareness or interpretation. In discussing design, Donald Norman (1988) emphasizes four principles:

- *Visibility*. Through perception, the user can easily understand the state of the system and determine alternative actions.
- *A good conceptual model*. The system allows a consistent and coherent presentation of the system throughout.
- *Natural mappings*. The system enables a natural relationship between the controls and their utilities.
- *Feedback*. The user receives continuous feedback about the result of his/her action.

In an effective system design, the user always knows what is going on and what her or his options for action are.

Norman's design principles can readily be seen in popular video games. For example, plants, which in role playing games (RPGs) are commonly used to heal injured characters, often stand out from their environments with unusually bright colors to attract the player's attention (*visibility*). Once perceived, the player's avatar can approach and pick the plants (*good conceptual model*). The plants heal the character's wounds during and after battles

(*natural mappings*). The success of the healing is often represented as a swirl of animated sparkles (*feedback*) that surrounded the avatar, who, now healed, can proceed to the next adventure. The bright colored plants for herbalism and rejuvenation in RPGs is a good interaction design because it makes uses of and capitalizes on both the physical properties and cultural dimensions of a real-life object; as a result, the player is able to interpret the situation and take appropriate actions in-game, using the interface efficiently to do so, and perceive the resulting effects. Indeed, in this case, the game succeeds at communicating information to the player that does not interrupt the flow of play through "attention-aware" interface elements (Dyck *et al.*, 2003). The visibility of both the artificially luminous plants and the sparkles signal to the player possible actions and their consequences.

Video games, as analogues to real life constructed for purposes of play, rather than productivity, imply particular kinds of interaction. The challenge for game interaction designers is to find the balance between constructing an experience without making players feel constrained (Pagulayan *et al.*, 2003). Instead of transparency and simplicity, favored in most productivity applications, interaction design in video games favors surprise, discovery, pattern recognition and experimentation. Indeed, the open-ended exploration of a game's possibilities is a large part of what makes the play meaningful, because it brings about the pleasure that keeps gamers engaged.

One way to approach interaction design in video games is to examine it in terms of *interaction cues*. I define an interaction cue as a *sign that provides information to players so that they are aware of their present interactive possibilities*. I contend that games generally present not just a collection of cues, but more precisely a system of cues, or what might be called a grammar of cues, which enables them to be meaningful.

How are cues organized into systems? In some games, such as *Tetris* (1986), the player has what Salen and Zimmerman (2004) call, "perfect information," which occurs when "all players have complete knowledge about every element in the game at all times" (p. 204). In other games, players have "imperfect information," which means that "some of the information may be hidden from players during the game" (p. 204). Thus, some games need to make visible their cues all at once, while others can lay them out over time, to aid in a temporal process of discovery. In the latter case, cues can be spread out in different media and in different ways: the player's interaction with in-world objects, through a conversation with non-player characters (NPCs), the player's accomplishment of a given task, or through the player's discovery of it latent in the environment. Thus, interaction cues can be, and are, organized temporally.

Another systematic characteristic of interaction cues is the relationship between the cue and the desired behavior. Some cues have a natural correspondence to their interactive possibilities, while others have a conventional or arbitrary relationship. In the former category are brightly lit flowers that have healing properties or ladders that can be climbed, and in the latter category are breakable objects in platformers, commonly used in these games, though not

in reality, to obtain power-ups, coins, and other desirable objects. Conventional cues, because they are arbitrary, may not be perceived to some users, even when they are clearly visible in the literal sense. The usability of games depends in part on the learnability of cuing systems – and this learnability is likely to vary by games. For example, experienced players of platform games know to break open as many crates as possible, while inexperienced players may leave them untouched and fail to attain their benefits. Likewise, a platform player may try to break open crates in non-platform games and experience confusion, frustration, or even damaging results. As Salen and Zimmerman note (2004), "If there is too much info, or if the info is neither discernable nor integrated, the design has failed to support meaningful play" (p. 210).

The position of this chapter is that a systematic analysis of interaction cues in games may shed light on the characteristics of games that makes them fun, meaningful, and usable. Using a ground-up approach, based on the study of hundreds of individual cues, we may gain a better understanding of the ways games signify to the player how to interact with them. This chapter presents a taxonomy of interaction cues in video games. This taxonomy helps designers and critics understand systematically the many ways players are encouraged to discover features of the game or interact and behave in desired ways. In addition, it should help designers and critics make useful associations, discover patterns, make predictions, innovate on new cues/interactions, and create useful analogies among cues, in-world objects, avatar capabilities, and player intentionality.

METHODOLOGY

Different theoretical frameworks may be used to study interaction cues. Designers in HCI may think of the theory of affordances, popularized by Norman. Those in cultural studies will likely think of cues as signs, and therefore consider semiotics. This chapter will leverage both of these frameworks to elucidate interaction cues as a meaningful interface system in games.

Semiotics is the study of signs, especially how meaning arises from signs. Signs can appear in many different forms, including text, cinematic imagery, sound, objects, etc. Signs include "everything which can be taken as significantly substituting for something else," or, in a famous formulation, anything that can be used to lie (Eco, 1976). Swiss linguist Ferdinand de Saussure proposes a two-part model of the sign, a signifier (the image) and a signified (the concept), and it is the combination of the two (the sign) that is meaningful (Chandler, 2002). Semiotics is especially concerned with how individuals create and attach importance to signs in the context of use. Hence, semiotics promotes the sensitivity towards the interrelations between individuals and socio-cultural conventions in explicating the functioning and meanings of the signs. Because interaction cues form systems that signify the possibility of interaction to players, they seem ripe for semiotic analysis.

The concept of affordance in HCI and design can also be used for the analysis of interaction cues. An affordance is concerned with the attributes of

objects that make them available for use by humans. The notion of affordance was developed by perceptual psychologist James J. Gibson, who believes an object's affordances are intrinsic to the object itself and therefore are independent of the perception or cognition of any actual human (Gibson, 1986). Thus, low branches on a tree afford climbing regardless of whether any human ever sees the tree.

The concept of affordance was popularized in HCI and design by Donald Norman, who in *The Psychology of Everyday Things* (1988, later renamed The *Design of Everyday Things*) uses the terms to refer to those attributes of an object that a person perceives to be of potential use. Thus, for Norman, affordance is tied to human perception and cognition, and more broadly, to the actor's own knowledge and culture. Norman uses the notion of affordance as a design strategy to emphasize the importance for the design of artifacts to provide perceptible information regarding characteristics of their use. To Norman, affordance only exists when the information specifying the object's functionality is available to the actor. As Norman suggests, "when affordances are taken advantage of, the user knows what to do just by looking: no picture, label, or instruction needed" (Norman, 1988). In a game environment where perceptual information is crucial in determining and affecting the player's course of actions, examining interaction cues from the perspective of affordances offers us a vocabulary that connects perception and action.

As we elaborate above, semiotics and affordances provide vocabularies flexible and systematic enough for us to gain insight into the complex relationships between interaction cues and player behaviors. The two approaches have overlaps, suggesting that they have similar concerns, including the connections among signs, interpretation, and behavior. However, they are also used for different purposes: semiotics is a critical strategy typically used to explicate how sign systems contribute to the emergence of meaning for a community of users. The notion of affordance provides a strategy for designers to think about how to create features that suggest interactive possibility. By building our analysis of interaction cues on the combination of these different approaches, not only do we benefit from each, but we can also leverage the analysis for multiple ends in design and critical analysis of meaning.

For this study, I documented a total of 388 cues from 29 games, in ten different genres[1] (Appendix 1). The games were selected based on a few different criteria. Chief among them was the fact that all the games received positive critical acclaim, from game review sites, such as GameSpot. I chose critically acclaimed games on the assumption that their interaction cues were likely to be the most worthy cues to study. The games were also selected for generic diversity, to ensure that games of one type did not dominate. Another criterion is that all of the games are relatively recent, because recent games are more likely to be fully 3D and feature a high diversity of game elements. Finally, the selection included games familiar to the researchers, since getting to know a game well can take ten to hundreds of hours.

1 The game genres are based on existing conventions, which have been discussed by Crawford (1982), Wolf (2002), and Apperley (2006), among others.

The study adhered the following procedures: each game was played, observed, and videotaped on average one to three hours (not necessarily from the beginning), to obtain a sample of its interaction cues. Numerous characteristics for each cue were documented in the process, as shown in Table 1.

Artifact-Centered Characteristics	Human-Centered Characteristics
• The time and sequence (order, duration, iteration) • Space and setting (location, environment) • Occasion • Medium • Physical attributes • Function • Diegetic vs. non-diegetic nature	• What the human has to do to perceive it as a cue? • What types of audience is the cue aimed at? • What knowledge does the cue take for granted? • What kind of response does the cue expect the player to have? • What are the consequences for not responding to the cue in desired ways?

Table 1. Characteristics of interaction cues documented in the study.

These characteristics were then sorted into categories, which eventually yielded a taxonomic structure. Each of the 388 interaction cues was individually assigned to a branch of that schema to verify that the taxonomy was comprehensive and its categories were exclusive. Obviously, several adjustments were made along the way.

A TAXONOMY OF GAME CUES FOR THE DESIGN AND ANALYSIS OF GAMES

A taxonomy is a good way to organize a large amount of related information, as its structured nature often illuminates relationships of elements to each other as well as the principles that govern such relationships. The 388 cues collected in the study present a wide range of characteristics and features. The taxonomy (Figure 1) allows one to tease out fundamental distinctions among these cues, enabling the elaboration of a language to critique issues concerning game design and usability relative to cues. It is not my intention to make scientific claims concerning the classificatory structure, as if I were asserting an ontological reality to cues; rather, I believe the taxonomy provides a heuristic for understanding different ways interactions are suggested to players in game interfaces.

Interactivity

The first branch in the taxonomy distinguishes between those game elements that are interactive and those that are non-interactive. This category more or less corresponds to Gibson's (but not Norman's) notion of affordance, because it considers the capacity for interactivity without regard to any player or perception. Interactive elements include those that players can modify, those that modify players, those that have some effect on game play, and so on. Non-interactive objects are often decorational, that is, placed in the environment to improve its illusion as a virtual space, as opposed to being used in actual game play.

This leads to a critically important question: how does a player know whether something is interactive? Without a correct mapping of interactive versus non-interactive elements, interfaces may become unusable.

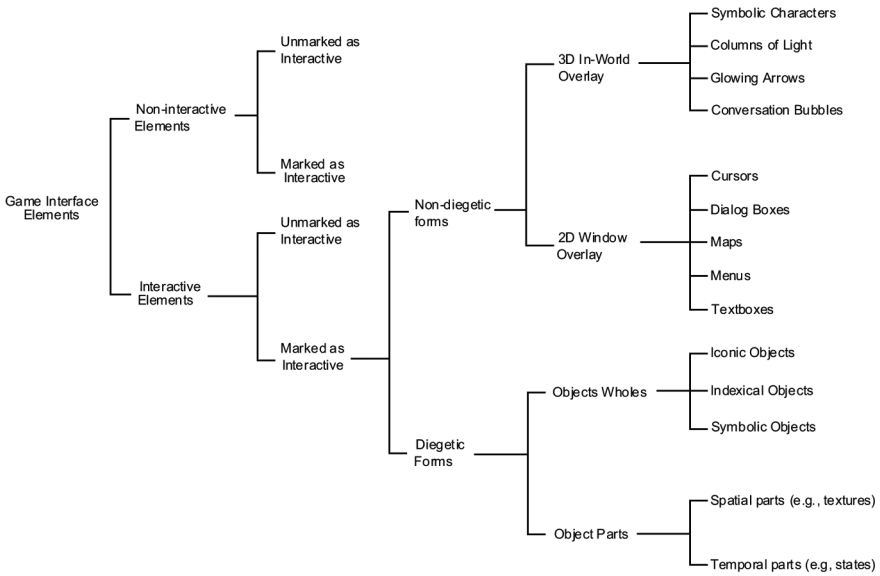

Figure 1. A Taxonomy of Interface Elements in Games

Markedness

The second level of branching concerns the principle of marking. That is, it addresses whether a given element is marked in some way as interactive. As a rule, most (but not all) interactive elements are also marked as such. Likewise, most (but not all) non-interactive elements are not marked as interactive.

The notion of markedness comes from semiotics and was introduced by the Russian linguist Roman Jakobson, who defines the concept as follows: "every single constituent of any linguistic system is built on an opposition of two logical contradictories: the presence of an attribute ('markedness') in contraposition to its absence ('unmarkedness') (Chandler cited Lechte, 2002). The marked form is different, foregrounded, and salient, while the unmarked form is neutral, normal, and attracts no attention to it (Chandler, 2002). The concept of markedness, hence, is used to organized elements in relation to each other through *highlighting* and *understating* (Riggins, 1994).

An example of markedness can be seen in *Pikmin* (2004), by comparing two different types of flora, one interactive (and marked as such) and one non-interactive (and unmarked). Figure 2 shows three flowers in the foreground, which are bright, animated, and conspicuously featuring numbers; in the background, a plain green plant stands. The bright coloring, foreground-

ing, and numbering on the foregrounding flora both signifies the fact that the flowers can be interacted with and also some information about the nature of that interaction (concerning the resources required to interact with them).

The markings help the player see which screen elements are *intrinsically active*, and which, such as the green plant in the background, are *intrinsically passive*, meant only for decoration (Emmison & Smith, 2000). Combining the two oppositions – interactive vs. non-interactive and marked vs. unmarked – yields four possibilities, described as follows.

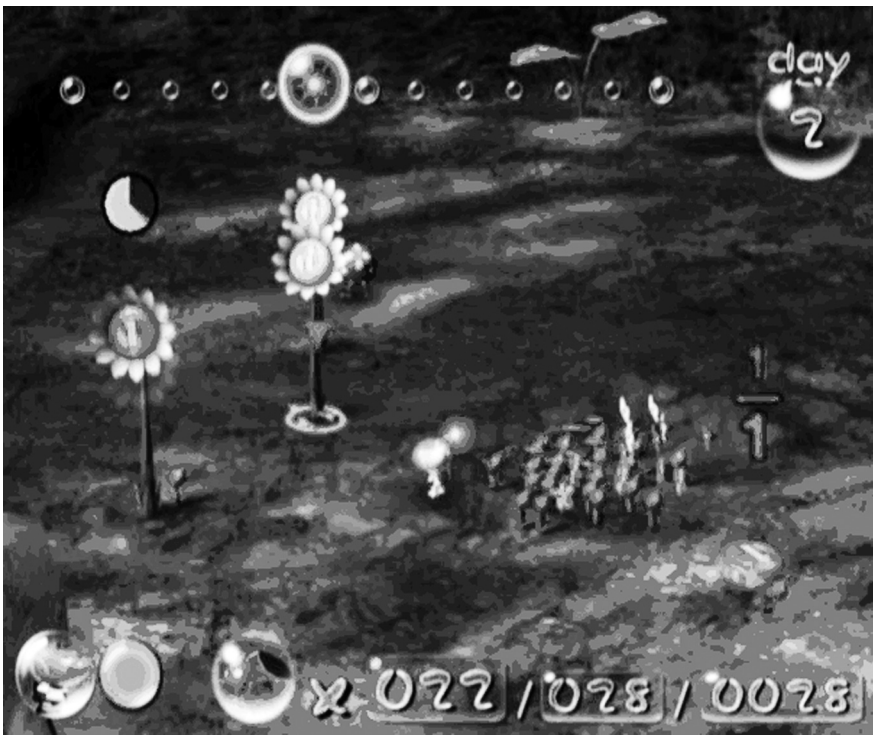

Figure 2. Marked versus unmarked flora in Pikmin.

Non-interactive elements not marked as interactive. Environmental elements (e.g., sky, mountains, trees, rivers, buildings, etc.) intended only as decoration and/or backdrops belong to this category. The stationary flora in *Pikmin* is a example of an unmarked, non-interactive element. In addition, non-interactive non-player characters (NPCs), such as crowd members in many sports games, also fall into this category.

Non-interactive elements marked as interactive. These false cues represent a less common type, but one that I found plenty of evidence of in games. Generally, these involve false affordances (Gaver, 1991), that is, non-interactive objects that became marked as interactive. This raises the issue of intentionality, since it makes little sense for anyone to mark a non-interactive element as interactive. However, markings map not to designerly intention, but rather

to the community of interpretation. That is, designers don't always mark elements as interactive; conventions and user expectations may do so as well.

A couple examples illustrate this branch. Crates and boxes in platformers such as *Sly 3* (2005) and *Jak 3* (2003) are intended to be broken so that the player can collect important items or obtain extra points. The mere existence of boxes and crates in platform games has emerged over two decades as a cultural convention constituting a visual cue for the player to act, specifically by breaking them for rewards, such as bonus points and special items. However, crates also appear in non-platform games, such as first person shooter (FPS) games such as *Half-Life 2* (2005). In *Half-Life 2*, many of the crates cannot be broken, and in some cases, those that can be broken actually cause damage to the player. Thus, cultural convention marks the object with a cue that is not actually appropriate to the object (Figure 3).

Figure 3. Breakable items in platform games become cues of false affordances in some FPS games.

Another example, familiar to many gamers, is the case of the 3-foot fence that the tough marine or cyborg warrior protagonist cannot jump over. In distinction to the previous example dealing with game convention, in this case the player responds to markings from real-life affordances (in real life, any marine in combat shape could climb a 3-foot fence). If the fence cannot be climbed over, its presence manifests a false cue.

Operational here is a distinction introduced in the semiotics of cinema, between *cultural codes* and *specialized codes* (Metz, 1974). Cultural codes are "so ubiquitous and well 'assimilated' that the viewers generally consider them to be 'natural'…. The handling of these codes requires no *special* training…, no training other than that of living, and having been raised, in a society (p. 112, emphasis in original). Special codes, on the other hand, "concern more specific and restricted social activities…they required a special training…a training even the 'native' person, possessing the culture of his group, cannot dispense with" (p. 112). In these terms, an element can be (correctly or falsely) marked as interactive by cultural codes (3-foot fences can be jumped by any able-bodied person) or conventional codes (crates are disposable containers with rewards inside).

Interactive elements not marked as interactive. Elements in this category are typically considered secrets or "Easter Eggs," for which no cue exists to suggest their interactivity. In *Final Fantasy X* (2001), certain hidden loca-

tions of the world can only be accessed by selecting specific coordinates while aboard an airship; the game provides no cues that these places exist at all, and therefore no motive to discover their coordinates. Players can only find them through trial-and-error or (more likely) through strategy guides and online walkthroughs.

Interactive elements marked as interactive. This is the main category of interest for interaction design in games in our taxonomy, and I will discuss this in detail in the next section.

Diegesis

From this point forward, I consider only interactive elements marked (in one way or another) as interactive. These elements can be subdivided into two categories: those with diegetic forms versus those with non-diegetic forms. *Diegetic forms* are those elements whose embodied representations/media belong to the in-game story, which are perceivable by the in-game avatar. Non-diegetic forms, in contrast, involve a mediating mechanism (e.g., interface elements, such as dialog boxes and special cursors) which are external to the depicted events. Examples of diegetic cues include unlocked doors in *Oblivion* (2006) through which avatars can pass, edges of cliffs onto which avatars can hang and climb in *Shadow of the Colossus* (2005), as well as climbable ladders in *Jak*, *Grandia 3* (2006), *Thief: Deadly Shadows* (2004), and *Ico* (2001). Examples of non-diegetic cues involve highlighting systems, such as the red light column above the opponent's head in *SSX 3* (2003), the blue highlight that appears over openable doors in *Thief: Deadly Shadows*, or special cursors (e.g., indicating skinnable corpses) in *World of Warcraft* (2004). As Figure 4 shows, a given element's interactivity can be marked by both diegetic and non-diegetic cues.

Diegetic cues enable designers to communicate to the player through the avatar; non-diegetic cues enable designers to communicate to players directly.

Medium

The fourth branch addresses the particular medium of the cue, a category that applies equally, but differently, to both diegetic and non-diegetic forms of cues. The medium is important, because it establishes the player's relationship to its contents, profoundly affecting perception and behavior, and as a result, the medium plays a major role in the rise of meaning in the interactive system. The medium is not an incidental container for its content, but rather constitutes and embodies the message (McLuhan, 2003). One place to gain an understanding of the operation of cue media is when a given interaction contains multimodal cues, that is, the "same" cue is given in two different media. An example of this kind of cue occurs in *Kameo* (2005): when the avatar fails to achieve an objective after a certain amount of time, the game provides a more explicit set of directions than previously given. This new set of directions is provided via a talking book trope. The book, of course, is visual and contains

text and images; the fact that it talks also provides audio cues. Interestingly, though the visual book provides both diegetic and non-diegetic cues, describing what the player should do to the point that it references the buttons on the controller the user should press, the audio portion provides strictly diegetic directions, omitting any reference to the controller or even the fact that this is a game. The different media – the disembodied voice of the narrator placed into a visual representation of a book – serve different purposes and establish different relationships with the player, even when they purport to be saying the same thing. The audio narrator speaks indirectly to the player through the avatar; the book communicates directly to the player with words and images that mix game and real-world realities.

Figure 4. That Sly can tightrope walk is indicated by both diegetic and non-diegetic cues.

Diegetic forms: Wholes versus parts.

I subdivide diegetic forms into two categories: "object wholes" and "object parts." Object wholes refer to objects that are interactive as wholes; ladders, save spheres, and collectible energy balls are all whole objects that players interact with as such. Players interact with object parts when only a portion of an object is interactive or suggests interactivity; for instance, an object with a special texture applied to it, which is in a particular state, is interactive only as a part of the whole. Our interactions with these objects and parts of objects occur primarily through "direct manipulation," a term Shneiderman (1983)

introduced to HCI to characterize how graphical user interfaces introduce a sense of direct control over onscreen elements by visualizing objects, states, and the consequences of actions in ways that appear natural and intuitive, which supports higher level thinking, such as problem-solving and critical thinking.

Whole Objects. This category contains those elements that are recognized and used as whole interactive objects. However, just because these objects have a concrete and natural representation in the world does not imply that they necessarily signify interactions in natural, or iconic ways. Some objects, such as ladders meant to be climbed, do; however, others, such as floating pink energy ball pick-ups left behind by vanquished foes in *Jak 3* have no real-life counterpart, and therefore must be learned, before they can cue actions.

American semiotician Charles Peirce's trichotomy of icon, index, and symbol provides a vocabulary to describe and classify the mode of signifying of whole interactive objects in games. Peirce's notion of *icon* refers to a sign's representation of its object "mainly by its similarity" (quoted in Chandler 2002). To Peirce, a sign is an icon "insofar as it is like that thing and used as a sign of it" (quoted in Chandler 2002). In iconic mode, the signification of the sign comes about through resemblance. A lit candle in *Eternal Darkness* (2002), which the player's in-game character can perceive and manipulate (e.g., blow it out) is an example of an interaction cue's signaling to the player using the iconical approach. Similar examples drawn from the study include switches and levers in *Ico* and *Myst V: End of Ages* (2005) that the in-game character can manipulate to open doors; bars and pipes that stick out of otherwise smooth walls in *Jak* and *PsychoNauts* (2005) that afford swinging to a higher ground; Ivy plants in *Metal Gear Solid 3: Subsistence* (2006) in which the protagonist Snake can latch upon and climb to get down to the ground; etc. (Figure 5). Generally, iconic objects occur when their affordances match their intended use. Moreover, because they associate so readily with familiar objects in the real world, any cultural codes associated with these objects can also be leveraged for meaning in video games. Since the player is allowed to respond to these iconic cues in games in an intuitive manner by drawing upon real-life experience, it greatly diminishes the likelihood for player frustration (Gross *et al.*, 2005).

Figure 5. A climbable chain (iconic signification), a damaged car with loose controls (indexical signification), and a save sphere (symbolic signification).

According to Peirce, the *index* occurs when the mode of signification is cause and effect, such as a column of smoke functioning as a signifier for a fire beneath it. A good example of an indexical cue is the moving grass in *Metal Gear Solid*, which indicates there are small animals hidden in grass, which can be killed and saved for future food source. Another common example is the red and white fences around the edges of sharp turns in the tracks of *Rallisport Challenge 2* (2004), a racing game. In many racing games, a visually beat-up car often signifies that the controls will be less responsive, simulating car damage (Figure 5). Interaction cues of indexical nature still signify in non-arbitrary ways, but an extra level of inference or interpretation is required to make them comprehensible; as a result, they can be somewhat less usable than iconic objects and may require some training before players can correctly interpret them.

The *symbol* signifies arbitrarily and based on convention. Peirce describes a symbol as a sign "whose special significance or fitness to represent just what it does represent lies in nothing but the very fact of there being a habit, disposition, or other effective general rule that it will be so interpreted" (cited in Chandler 2002). Accordingly, learning is required to understand and interpret the relationship between the signifier and the signified in the symbolic mode, as in the case of a save point in *Grandia 3*, represented as a "save sphere." (Figure 5). An interesting example of symbolic signification of objects occurs as a part of the complex economic system of *World of Warcraft*, in which, as a rule, higher level foes drop higher value items. But this system may appear to have strange consequences when, for example, one compares what is dropped by a level 3 human bandit (typically a sword or chain mail) with what is left behind by a level 30 spider (typically a gooey substance known as "ichor"). In the marketplace, the ichor can be worth much more than the sword or mail, which makes little sense on the face of it. But whereas the sword or mail is weak and offers little value after level 3, the ichor can be used in recipes to cook valuable items that are useful throughout the game. Thus, unless one understands the values of spider ichor in *World of Warcraft*, the comparative value of ichor over a sword or chain mail is counterintuitive. This is not a natural or cause-and-effect relationship; it is a conventional one created by the rules of *World of Warcraft*, and thus the ichor's affordances must be learned to be perceived. As William Gaver suggests, learning in the context of affordances can be seen "as a process of discriminating patterns in the world, as opposed to one of supplementing sensory information with past experiences" (Gaver, 1991). Once these conventional symbols are learned, the player becomes a part of a semiotic community with access to certain specialized codes, which are presupposed for appropriate action.

Object as parts. In addition to perceiving and using objects in their entirety, players also must learn to interact with parts of objects, which are perceived as parts either spatially (e.g., textures) or temporally (e.g., state). One strategy to signify how to use a part of an object is to give it a unique texture. A texture depicting a crack on an otherwise smooth

wall in *PsychoNauts* suggests that that portion of the wall can be broken; differently textured floor tiles in *Eternal Darkness*, when stepped upon, trigger booby traps; muddy surfaces on the ground slow down Jak's vehicle; a change of texture on the ground in *Thief: Deadly Shadows* indicates the difference between stone and metal, and thereby soft and loud footsteps, and encourages the stealthy player to respond accordingly; tire marks on roads to indicate optimal driving paths around tight curves in *Rallisport Challenge 2* – all these examples demonstrate how textures are used in a part-to-whole (synecdochic) relations between different spatial areas of objects.

The video game is a dynamic medium; actors and environmental elements change. This change introduces a need to ensure that the state of these elements is visible to the player. Games deal with state in different ways. In *World of Warcraft*, if an enemy is nearby that (a) is dead; (b) was killed by the player; (b) has not yet been looted, then sparkles appear above it indicating that it is in a lootable state. If any of the three criteria are not met, then it is not in a lootable state (at least by this player), and no sparkles appear above the body (in this player's client). In one segment of *Jak 3*, Jak is in an area with dangerous lava bursts. Just before lava bursts out of the ground, a gurgling noise signifies that the lava has left the dormant state and has entered the about-to-burst state, which is of course followed by a burst state, during which Jak needs to jump onto another platform to stay safe. Sounds are used in *SSX 3* to indicate one's position in the race: characters chatter and trash-talk when they pass one another, providing audio cues that one's place has moved forward or backward in the race. Interestingly, aural cues are more likely to be diegetic than visual ones; perhaps that's because it's easier for the eyes to distinguish among diegetic versus non-diegetic forms than it is for the ears. Regardless, aural cues tend to be subordinate to visual ones, helping players form correct interpretations about the visuals, a finding also seen in a study of Web pages with audio (James, 1998).

Non-diegetic forms.

Having explored diegetic cuing systems, let us now turn our attention to non-diegetic forms. These I subdivide into two categories: "3D In-World Overlays" and "2D Window Overlays." Here I rely on a distinction Manovich (2001) makes between two types of window: the *transparent* window, which is a viewport through which we see other worlds, and the *opaque* window, covered in menus, icons, and buttons that force the viewer to act. 3D in-world overlays include non-diegetic elements that are nonetheless presented inside the 3D world. A typical example is the diamond that appears over the head of the currently selected character in *The Sims 2* (2004). 2D window overlays may contain diegetic or non-diegetic information; it is their presentation that is non-diegetic. A simple example is a dialog box that pops up in a Japanese RPG that asks you to confirm whether you really want to leave an area. The operative distinction between these two types of cues is that 3D overlays pro-

vide cues relative to the space of the in-game character or avatar, while the 2D overlay provides cues external to the space of the avatar.

3D in-world overlays. Numerous types of 3D in-world overlays provide interaction cues. One kind of information are directional cues, which are often provided as columns of light emanating from an important location, such as a target spot toward which the player is supposed to go (*Sly 3*), or an important person, such as the player's competitor in a race (SSX 3). Large glowing arrows are common in racing games, such as *Burnout Revenge* (2006), indicating the location of the racetrack.

The use of floating letters, symbols, numbers, and shapes inside of 3D worlds is another way for the game systems to convey messages to the player. Yellow/silver exclamation and question marks over NPCs' heads in *World of Warcraft* signal the status and availability of quests; likewise, red exclamation marks over stars' heads in *The Movies* (2006) indicate emergencies needing attention; an interactive gun target reticle in *Ghost Recon: Advanced War Fighter* (2006) features color-coded representations when friendly or enemy targets are aimed at as well as symbols indicating the quality of the aim. In these examples, characters and simple shapes from written symbolic systems communicate states and interactive possibilities dynamically and in a contextually embedded way.

2D window overlays. The other major type of non-diegetic interaction cue forms are two-dimensional screen overlays. These include cursors; dialog boxes; HUD elements, such as health and stamina meters; mini-maps, and so on. These elements are not only not perceptible to the in-game character, but they are not generally put into any sort of spatial relationship to them (first-person shooters complicate this statement, since the view of the player is fused to that of the character in a literal way). Sample cues include special cursors, such as those in *Oblivion*, which not only signify possible actions, but even a moral/legal stance toward those actions (e.g., red cursors indicate illegal activity). Similarly, different cursor icons in *The Sims 2* signal different potential actions: a footprint cursor icon means the Sim can proceed, and a stick figure suggests you can converse with a given Sim, etc. Dialog boxes, seen in most Japanese RPGs are used for a different kind of interaction. By clicking through dialog boxes, the story advances, enabling the player to control the pace of the game. 2D window overlays are especially common in games in which management is heavily featured, such as *Civilization 4* (2005). Of course, decades of productivity software have offered numerous analogues for management interfaces, and they are predominantly two-dimensional. At the same time, 2D interfaces also establish a relationship between player and content, a relationship of distant, and sometimes even god-like, control.

THE LANGUAGE OF INTERACTION CUES

The taxonomy of game elements is intended to do more than offer a place for each interaction cue found in a given game. Rather, its value is in its capacity to elucidate how individual game elements actually form a meaningful cuing

system. Different types of game element signify and are perceived in different ways; they encourage different sorts of behavior; in some cases, they correlate to genre. Taken together, the system provides a sophisticated language, which enables games to feature a diversity of interactions and meanings arising from them. In the concluding discussion, I consider a couple examples that illustrate how interaction cues are used as a sign system to create meaning.

Cues and Player Behavior

The taxonomy helps us describe game innovation and the origins of the new meanings that it makes possible. As an example, consider the effects of a single innovation in the interaction design of army management seen in *Black and White 2* (2005). In strategy games, such as *Age of Empires*, *Civilization, Rome: Total War* (2004), and so on, moving military units typically involves selecting the unit (as a group) and right-click on the map, causing the unit to move toward that spot. Non-diegetic 3D in-world overlays represent both the selection (and selectability) of a given unit as well as the point on the map selected. This interaction gives the player quick and absolute control over the unit and its positioning.

Black and White 2 (along with its predecessor, *Black and White* (2001)) is a much more (literally) hands-on game. The *Black and White* games turn a standard PC cursor into a hand with an extraordinary range of capabilities and even expressions, which affects all kinds of interactions. *Black and White* embodies the interaction with its super-cursor-hand, such that to move a unit of troops, the player literally picks up the collection of soldiers in her or his divine hand and drops (or throws) them at the desired location. The interaction is strangely diegetic, because the hand is no longer merely a cursor, but a special kind of avatar in the world. This fundamentally changes the relationships among the player, the avatar, and in-world content. The meanings of the interactions between player and in-world objects also change; often they take on a degree of humor not seen in other strategy games, especially if one inadvertently (or not-so-inadvertently) sets down (or throws) one's own worshippers roughly. Such behaviors, of course, lead to *Black and White's* central mechanic, which is the moral feedback the game provides, based on the ways the player, through the hand avatar, interacts with her or his people.

Cues, Affordances, and Complex Actions.

When discussing the concept of affordance, Norman introduces three types of constraints in *The Design of Everyday Things* (1988): physical (related to real affordances – not being able to jump over a fence is an example), logical (good at directing behavior through deduction and inference), and cultural (the use of shared conventions for a particular cultural group) (Norman, 1988, 1999). For the final example, I explore the operations of logical affordance in a side quest sequence. Within each area of *Sly 2* (2004), Sly has the option of collecting a series of bottles, which can be used to unlock a special power-up; this activity

is entirely voluntary, in the sense the player can finish the main game and not complete this side quest on any of the levels. The way it works is that somewhere on the level there is a safe; opening this safe requires obtaining a special code; the code can only be broken if Sly collects all 30 bottles on the level, each of which contains a clue; when all 30 bottles/clues are collected, an NPC breaks the code and provides Sly with the combination to the safe; if he goes to the safe and enters that combination, he can open the safe and obtain the special power-up.

How does this side-quest operate from the standpoint of interaction cues? Several of the bottles are left out in highly conspicuous places, making it almost involuntary for Sly to begin the side quest; he will always get some bottles, just by working through the level. Each time he acquires a bottle, a 2D cue appears briefly on his HUD indicating that he has acquired X/Y bottles (e.g., 5/30 bottles). This cue provides a logical constraint, because the player (if not the diegetic Sly) knows, without seeing them, that scattered throughout the level are (in this case) 25 more clues hidden in bottles. Each bottle announces its existence through two cues: first, each bottle is a large and animated object in-world, visible to Sly even from a distance; second, each bottle makes a clinking noise when Sly is nearby. Logical constraints let the player know that even distant bottles with no clear route of access are still somehow accessible; likewise, the clinking sound alerts the player to the presence and accessibility of nearby bottles that are not even visible. The use of a safe in this quest is by itself another cue: in platformers, desirable and valuable things are commonly hidden in artifacts such as containers, crates, and safes (cultural code), but in contrast to crates and barrels, a safe does not afford breakability, and instead suggests another means – a key or combination – may be necessary to enter.

As the bottle/safe side quest suggests, usability in traditional sense is problematic in the context of video games. Obviously, the placement of the power-up in a safe that can only be accessed if all thirty bottles, some of which are hidden in odd locations, are collected, is not as "usable" as making the power-up available from the start. But doing so would take away fun and challenge that makes the game what it is; yet it is also undesirable to have an unusable game. One solution, used in this side quest to good effect, is to implement "usability in sequence": the game disperses and breaks up the usability into a sequential, step-wise process (collecting bottles→getting messages from the bottles→obtaining combination for the safe→find the safe→opening the safe), using a combination of cues of physical, logical constraints, and cultural codes to provide information to the player. The method rewards those who are patient enough to spend the time to complete the side quest. Once these side quests are mastered, the rest of the game becomes much more "usable," because these players have power-ups that other players do not. The goal of the design then, is to take into account both the design of the information that specifies the affordance as well as the affordance itself (McGrenere & Ho, 2000).

As the examples and foregoing discussion have shown, a game's communicative capacities are enriched by the system of interaction cues that are part

of the language of games. The taxonomy of interaction cues introduced in this chapter is intended to help interaction and game designers, critics, and researchers better understand this language. Doing so facilitates the identification of the usability issues and sources of frustration for the player when interacting with the game as an information system; at the same time, it also can shed light on the origins of pleasure, meaning, and fun in games.

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APPENDICES

Game Genres	Games Examined
Action/Adventure	• Shadow of the Colossus • Kameo: Elements of Power • Ico
Puzzle/Adventure	• Myst V: End of Ages • Pikmin
First Person Shooter (FPS)	• Half Life 2: Episode One • Perfect Dark Zero • Metroid Prime
Platformers	• Sly 3: Honor Among Thieves • Jak 2 • Psychonauts
Role-Playing Games (RPG)	• Final Fantasy X • Grandia 3 • The Elder Scrolls IV: Oblivion • World of Warcraft (MMORPG)
Racing	• Burnout Revenge • SSX 3 • LA Rush • RalliSport Challenge 2
Simulations	• The Movies: Stunts & Effects • The Sims 2
Strategy	• Civilization 4 • Black & White 2
Stealth	• Thief Deadly Shadows • Metal Gear Solid 3: Subsistence • Ghost Recon: Advanced War Fighter
Survival Horror	• Fatal Frame II: Crimson Butterfly • Silent Hill 2 • Eternal Darkness: Sanity's Requiem

Appendix 1. Games Examined Based on Genres

Clara Fernández-Vara

Shaping Player Experience in Adventure Games: History of the Adventure Game Interface

THE SEARCH FOR DIRECT MANIPULATION

The adventure game genre is almost as old as videogames themselves. It takes its name from *Adventure*, programmed by Will Crowther in 1975 and expanded by Don Woods the following year. During the 1980s, adventure games were the leading genre in home computers, thanks to companies such as Inform, Sierra Online or LucasArts. In 1993, Cyan's *Myst* became the best-selling computer game (until the arrival of *The Sims*), and reinvented the genre. In the following ten years, the models set by the companies just mentioned were replicated by other developers, without there really being any significant overhauls to the conventions of the genre. This lack of innovation has contributed to the decrease in popularity of the genre in the mainstream. The development of adventure games, however, has not stopped, thanks to diverse independent developers and publishers, as well as a growing community of amateur developers using outdated engines to make their games. In the last couple of years, changes in input devices, such as the popularization of game controllers, touch screens, and the use of gyroscopes have brought fresh air to the genre, creating new ways to immerse into the gameworld.

Current adventure games are very different from *Adventure* – the genre has been in a constant flux, which is most obvious in its interface design. From the prompt for keyboard input of Infocom games, to verb menus, to point-and-click contextual icons, adventure games have gone a long way in shaping player interaction. This constant re-design is not a question of mere aesthetics – it is key to help the player learn what can or cannot be done in the game. The evolution of the adventure game interface has looked for improving direct manipulation of the entities in the game, where the instructions to be followed by the computer imitate situations and objects of the outside world, using visuals instead of a command line (Shneiderman, 2003). Direct manipulation does not only refer to interface metaphors alone, but to any visual representation that is analogous to some concept the user/player is already familiar with. Visuals give immediate feedback about the success or failure of the command, and makes syntax error messages unnecessary. Enhancing direct manipulation also contributes to the illusion of immersion in the game, because the player does not have to learn the command syntax on top of the

individual actions, as well as helping sustain the fiction of the world. The player can intervene in the gameworld directly, without typed commands or error messages to remind her she is using a computer program.

This chapter is a history of the transformations of the interface adventure games have gone through in Europe and the US, and how the increase in direct manipulation interfaces has affected the playing experience, from text adventures to the current generation of consoles. The terms and concepts are based on Shneiderman's seminal article 'Direct Manipulation: A Step Beyond Programming Languages' (Shneiderman, 2003), as well as the definitions used by Nick Montfort (2003) to talk about Interactive Fiction, and the game design elements that are being worked on in the Game Ontology Project (see Zagal *et al.*, 2005).

DEFINITION OF ADVENTURE GAMES

The phrase "adventure game" has been used to refer to many different types of games, several of which will not be considered for this chapter. Generic definitions are always complex, and hardly account for all the possible texts belonging to a genre; it is the case in videogames as it is in film, literature or music. Given the limited scope of the chapter, we will list the features that are common to the games I will be dealing with.

The task of defining adventure games is a slippery one. Traditionally adventure games are associated with stories, since it allows players to progress through a narrative event structure. In this sense, one might reckon they fit Espen Aarseth's concept of *ergodic literature* (Aarseth, 1997), because they require "nontrivial effort […] to allow the reader to traverse the text." However, if advancing in a story requires a nontrivial effort, then any game that rewards the player with a segment of a story after she has completed a particular challenge could also be considered ergodic literature. This type of reward is becoming a commonplace in videogames, so that we have puzzle games such as *Magical Drop II* (1996) or fighting games *Soul Calibur* (1999), which will present short cut-scenes after every stage is completed. This way of fragmenting the narrative may not be considered ergodic literature (or storytelling, for that matter). Adventure games, by contrast, use the same framework and entities to tell the story as well as play the game – there is an overlap in the creation of the fictional world, where the story and the gameplay are using the same devices and signifying systems. In other words, the world is the same for the game and the story, the actions of the player overlap with the events in the story, and the entities of the game overlap with the characters and objects of the story. Challenges in adventure games appear in the form of puzzles, i.e. challenges where there is no active agent against which the player is competing (Crawford, 2003). They usually have at most a few correct solutions that must be figured out (Rollings & Adams, 2003). Puzzles slow down the pace of gameplay, since hand-eye coordination and quick reflexes are usually not required.[1]

1 See the Game Ontology entry for Puzzle, for further discussion and examples: http://www.gameontology.org/index.php/Puzzle

The textual interface and programming language of early adventure games also served as the basis for the literary genre of Interactive Fiction (IF), a genre that, though related, extends beyond the domain of videogames. IF is an exclusively text-based genre of electronic literature; according to Montfort (2003), it is a type of narrative whose content is revealed usually by problem-solving. The pleasure does not come from reading alone, but also from figuring out the puzzles and riddles. Text adventures (i.e. adventure games with a text-only interface) are a sub-genre of IF, defined as "an interactive fiction work in which the interactor controls a player character who sets out on out of the ordinary undertakings involving risk or danger" (Monfort, 2003). This distinction between IF and text adventures is merely thematic – text adventures usually involve accomplishing an extraordinary task, emulating the heroes of folk tradition. For instance, Infocom's *Deadline* (1982), as Montfort (2003) remarks, is a detective mystery, which may qualify as an adventure even if its setting is not "out of the ordinary". On the other hand, a work like *Photopia* (1998) by Adam Cadre is interactive fiction, but would not be considered a text adventure, since there are no complicated puzzles to solve; however, in some sections of the game the player controls a character in a fantasy world who sets out on a quest. The definition between these two textual genres cannot be clear-cut, but rather they are the two extremes. Story-driven pieces with less puzzles tend towards IF, while more challenge-oriented pieces following the traditional quest structure are closer to text adventures.

IF has evolved to give even more emphasis to storytelling, becoming more literary by restricting the player's choice of actions (by using menus, for example), and leaving out game elements such as combat or treasure hunting. Conversely, puzzle-solving, treasure-hoarding and spatial navigation prevail as forms of interaction in text adventures. The differences between both genres are now more evident, given that adventure games have left behind the text-only screen and developed a graphical user interface.

Compared to IF, adventure games are story-driven puzzle games, where the story and the puzzles use the same signifying systems. This is clear in the case of text adventures, since the story appears written on the screen, and the player must also type to affect the development of the game. Graphic adventure games (i.e. adventure games with a graphical interface) told stories with images and text; the characters that appeared in the story would also be available for manipulation during gameplay. It is common in most game genres to present cut-scenes with the stories of the manipulable entities; however, the actions presented in these cut-scenes are not available as types of manipulation in the game. For example, in *Metal Gear Solid 2* (2001), the player character only speaks face-to-face in cut-scenes, but dialogue is not an option during gameplay.[2] Other game genres are incorporating strong backstory components as a way to engage the player, also as a commercial hook-up to relate the game to some pre-existing franchise that extends to films, comics or novels, such as

2 Metal Gear Solid 2 incorporates a radio-talking system, which takes the player outside the gameworld, to save the game and get various pieces of information about the place/situation the player character is in. It is more of an information system in dialogue form than an actual dialogue system.

the games inspired by the James Bond franchise *Goldeneye* (1997) and *From Russia with Love* (2005).

As a consequence of the overlap between the manipulable entities and characters in the story, there is always going to be a player character, which will be the main entity carrying out the player's commands in the gameworld and providing the point of view for spatial navigation. The relationship between the character and the player will waver from being a surrogate to complete detachment; the interface will help define the relationship between both. The player character does not have to be unique – *Maniac Mansion* (1987) (and its sequel *Day of the Tentacle* (1993)) start with three player characters. A more intricate and self-referential example can be found in *Suspended* (1983), where the player character is in cryogenic suspension and cannot move, he can only send orders to the robots in the complex where he is kept, so that they communicate with different computers to save the world. That is, the player manipulates a character who manipulates robots that move around and interact with computers.

The features listed so far (story-driven games, with a player character) overlap with those of many other videogames that would not be considered objects of study here. For instance, the commercial site Mobygames lists *The Secret of Monkey Island* (1990) along with *Final Fantasy VII* (1997), *Planescape: Torment* (1999) and *The Legend of Zelda* (1986). Only the first title in the list is relevant for this study, because of the main mode of interaction is based on a verb + object structure. The other examples are different types of role-playing games (RPGs), a game genre that certainly relates to adventure games because it is also story-driven. However, the predominant form of challenges in RPGs is combat, the success of the player depends on managing resources in the form of character stats.

Adventure games usually offer a variety of actions to perform in the form of verbs; the player advances in the game by choosing the correct action and object in the gameworld. For example, in *Zork II* (1981) the player can "pick up brass lantern" to add the item to her inventory; she can then "light lantern" or "turn off lantern". All those actions are supported by the game parser and have an effect; however, trying "eat the lamp" will be responded with "I don't think that the lamp would agree with you." It is in the larger range of actions (verbs) that adventure games have tried to differentiate themselves from other genres.[3]

Unfortunately, this range is also the Achilles' heel of the interaction – how does the player know what she has to do? What is the right verb? At their worst, a session of playing an adventure game turns into a festival of combinatorics of verb + object (+ object). The crux that adventure games have been addressing over the years relates to the struggle between giving the maximum number of actions possible to the player – to create the illusion of freedom of interaction – and letting the player know exactly what has to be done to prevent frustration.

3 Verbs are also the key for what Chris Crawford calls "interactive storytelling" – the more interactive the designer wants to make a story, the more verbs are needed (Crawford, 2003).

The variety of actions usually goes beyond mere movement commands, attacks and trading, as in other genres such as first-person shooters or real-time strategy games. In order to advance in the game, the player must navigate the space to solve a series of puzzles by resorting to the verb + object type of interaction. These puzzles are usually interwoven, so that by solving a puzzle the player obtains an object to solve a previous one, or a new puzzle or puzzles appear,

The resolution of concatenated puzzles is not the only reward – adventure games encourage exploring the environment to its last possible detail, through navigation, examination of the objects and settings, and interaction with the non-player characters (NPCs). The exploration element has been handed down from the original *Adventure*, which was supposed to be a computer recreation of a real cave, imbued with Tolkienesque puzzles (Nelson, 2001). When the balance between exploration, NPC interaction and puzzle-solving is achieved, the game offers a world that is alive, enticing, and populated by characters that respond believably to the player's input.

Of the three elements just mentioned (exploration, NPC interaction and puzzles), convincing NPCs can be key to the appeal and consistency of the world. Most times an elaborate AI system does not guarantee a believable character (though it can certainly help). Adventure games try to achieve the verisimilitude of their characters usually through their dialogue, rather than their behaviour, which usually implies the presence of a dialogue system that is part of the wide range of actions available. The command "talk to + living object" can be enough most times to start the interaction of the player character with NPCs, though some systems may offer the possibility to choose what to talk about. Dialogue is always a problem, especially in the case of this genre, where it is supposed to be a means of enhancing the exploration of the gameworld and providing information about it. If finding the correct combination of verb + object can be tedious and frustrating, this grows exponentially when it comes to find a whole sentence structure to obtain the information needed. Adventure games have come up with different solutions to this problem, from typing the dialogue to menus and pre-canned conversations displayed when the "speak" command is chosen (this last being equivalent to a cut-scene at times). Significantly, the mechanics of these systems are highly dependant on the design of the overall interface, as the examples below will demonstrate.

The existence of different diegetic levels of interaction is another defining feature of adventure games. The gameworld is the main level of interaction where the events and actions of the game take place, being roughly equivalent to the concept of *diegesis* in literature and film. Montfort (2003), taking literature as his reference, defines the player actions that take place at this level as *commands*. Extending the literary equivalent (and following Genette (1980)), Monfort also defines possible hypodiegetic levels, as sub-areas of the diegesis; for instance, dream-worlds or simulations of other worlds within the main world. I would extend the concept of hypodiegesis to books and documents that can be read within the game – from the novel entitled *Deadline* found in the text adventure of the same name (which mysteriously has a plot

that the player seems to know already), to the books in the library of Phatt Island in *Monkey Island 2: Lechuck's Revenge* (1991), to the notes and books that reveal the story behind the landscape in the *Myst* series. Other examples of hypodiegesis can be mini-games, which can be played and replayed within the gameworld – a darts game in *The Lost Files of Sherlock Holmes: The Case of the Serrated Scalpel* (1992); or a whole other adventure game, as in the case of *Day of the Tentacle*, which included his prequel *Maniac Mansion* as playable game in one of the computers within the game. These mini-games may involve entities that are not manipulable outside of the mini-game (such as the darts) and may be replayed, without the new outcome having an effect on the development of the game. Adventure games are particularly accommodating to mini-games, since part of their nature is to involve concatenated puzzles and riddles, as mentioned above.

The third and last level of interaction, common to most videogames, is the extradiegetic. The actions that the player performs at this level are directives (Montfort 2003); they do not have an effect on the gameworld, but rather refer to the state of the game as a computer program: saving, loading, quitting, turning verbose descriptions on/off, music, sound effects on or off or skipping lines of dialogue or cut-scenes.

The development of strategies to improve direct manipulation in games has affected the features defining adventure games described above. To analyze this development, I have chosen three game engines from some of the most influential game companies in the genre to provide the main examples: Infocom, Sierra Online, and Lucasfilm Games/LucasArts. These engines provided a consistent underlying structure to their interfaces and set a standard for other developers. I have included *Myst* because it brought about significant innovations to the point-and-click interface, as well as *Farenheit* a.k.a. *Indigo Prophecy* (2005), because it explicitly proposed to establish a new standard interface for adventure games.

Text Adventures: Infocom and the Z-Machine

Infocom started off with the release in 1979 of *Zork* ('Infocom: The Next Dimension', 2005), the game they had programmed in a fortnight while they were studying at MIT inspired by Crowther and Woods' *Adventure*. Until its layoff ten years later, the company published 35 adventure games (Montfort, 2003). In order to facilitate the development of the same game for many different platforms, Infocom developed a multi-format emulator called Z-machine Interpretive Program. The emulator would be different for every platform; its purpose was to run the Z-machine virtual processor, to run any game written in the *Zork Implementation Language* (ZIP) ('Infocom: The Next Dimension', 2005). This meant that a game could be programmed once and then run in a variety of platforms.

The interface of text adventures, as their name indicates, is exclusively typed and syntactical, i.e. the interaction requires the user to learn the language and syntax of the commands. The syntax must be correct before even

trying to process the command; if it is not, a syntax error message will be displayed (Shneiderman, 2003). In text adventure games, it means that if the user makes a mistake in typing, even if the action is valid, it will not produce a result and will probably waste a turn. Text adventures base their interaction on indirect manipulation, which is not very intuitive, rather than direct manipulation, enacting directly where she wants to move by pressing up or down, as it was the case with arcade games (Shneiderman, 2003).[4]

The prompt of the blinking cursor to start typing can also be daunting; according to Donald Norman (2002), it's the antithesis of user-centred design. The player faces "the tyranny of the blank screen" and she is given "no hint of what is expected.". She has to type the action to tell her character what to do, and wait for a positive response to that input.

Starting to play an adventure game can be intimidating, given the detachment and lack of guidelines of the interface. Take the initial output of *Deadline:*

> You are on a wide lawn just north of the entrance to the Robner estate. Directly north at the end of a pebbled path is the Robner house, flanked to the northeast and northwest by a vast expanse of well-kept lawn. Beyond the house can be seen the lakefront.

The top of the screen displays a location name ("South Lawn") and the time of the fictional world the player has just set in motion (8:00 am). After this, a ">" appears and then the blinking cursor that indicates the player that it is her turn. Though the interface itself does not give any cues or pointers, as Norman complains, the screen is by no means blank. This opening is already giving clues to the player as to what to do: the player character has arrived to a house, she is at the entrance, so the logical course of action to take is to walk up to the door and knock. The interface may be bare, but the game comes with an instruction package that helps the player build the context to the adventure, and starts with a situation that the player is familiar with in real life (arriving to a house). A basic pleasure derived from playing adventure games is precisely being thrown into an unknown environment, forcing the player to explore it to "find her feet" in the gameworld, which includes drawing a map of the different rooms / locations. Text adventure games compensate for the lack of direct manipulation with carefully written descriptions, which is what gives the cues of possible actions.

It is false that anything can be typed, only certain commands will receive a positive response from the parser. There are no cues inside the game for the player to know what kind of syntactical structures will be valid. In one Infocom manual, they explain that in the game "you type your sentence in plain English each time you see the prompt (>). [The game] usually acts as if your sentence begins "I want to…" (*Wishbringer* manual, 1986). In earlier videogames like *Adventure*, or non-commercial works of interactive fiction, however, there are no instruction booklets, so the player would keep on using

4 See also Game Ontology, http://www.gameontology.org/index.php/Indirect_Manipulation

trial-and-error until something worked or she ran out of patience. Infocom's manuals usually included a list of only some of the verbs that are recognized by the game, inviting the player to experiment to find more, and giving a sensation of false liberty when typing the commands. Trial-and-error was therefore encouraged, which could also foster frustration if the player could only think of one way to express what she wanted the player character to do.[5]

The inclusion of dialogue was an early issue of adventure games. Zork avoided it completely, preferring to implement an RPG-like combat system to interact with the few NPCs. On the other hand, Infocom's *Deadline* was the first game that included a game parser to converse with NPCs. This mechanic was necessary because the player character is a detective to solve a case, and therefore must be able to cross-question witnesses and suspects. This is an example of an exchange in the game:

> ask mrs robner about mr robner.
"I loved my husband, no matter what you think. I am very sorry to have lost him." The speech is almost a set piece, and not too convincing.
> ask mrs robner about the will
Which will do you mean, the new will or the present will?
> ask mrs robner about the new will
"If there is a new will, I certainly don't know where it is."
> ask mrs robner about the present will
"Marshall takes care of that sort of thing. The will, I suppose, leaves the estate to George and me, but I can't be sure."

Even though the parser is very limited, the player can ask rather specific questions, and the game will even give hints about what can those questions can be. However, the player cannot input questions as if she was talking to a Weizenbaum's *Eliza* – the dialogue topics are always limited to those that are relevant to the game, or else the NPC will ignore your question, or the system will inform you that there is no object that corresponds to the topic you're talking about.[6]

The dialogue system adds yet another voice to the many that the player reads and types. Text adventures build a polyphonic environment – since it all appears in text, all the different levels of interaction share the same channel to communicate with the player. Nelson (2001) identifies those voices as that of the player (as the human who types and reads), the protagonist (the main character, who is usually the player character) and the narrator (the voice informing the player what the player character sees, feels and, occasionally, thinks). As Montfort (2003) remarks, the narrator can split into a fourth voice, the program itself usually communicating between square brackets,

5 Of course, many text adventures also have an obscure command, such as the magic word "xyzzy" in Adventure, or "Odysseus" / "Ulysses" in Zork to chase away the Cyclops. These cases are famous, but otherwise their oddity may very well lead the player to give up.

6 For a good tutorial to create NPCs, and a review of different dialogue systems in Interactive Fiction see Short (2003).

as a result of the syntactical mode of interaction. This voice tells the player whether it cannot parse a sentence, asks for clarification as for what item the sentence refers to ("Which will do you mean, (…)?"), or whether a certain action has made the player score any points. This polyphony makes the textual interface even more complex to use, and requires the player to be able to learn to identify the different levels of interaction.

The polyphony also makes it difficult to represent the player character. As Wood (1996) remarks, there are several possible types of player identity in IF (extensible to text adventures), of which the most common is the indeterminate character, usually male. This character becomes a surrogate where the player can project "whatever motives and emotions [she] like[s] onto [her] character" (Wood, 1996). This may seem the easiest character to write, since the designer is ignoring who the player character is. It does not mean that text adventures cannot provide the player with determinate identities, being by gender, by the player's own choosing, or determined by the player's actions (Wood, 1996), but these cases are the least common.

The textual interface makes it more difficult to allow the player to control more than one character during the game, or choose who she wants to control.

> Text adventures depend heavily on description and interaction for their atmosphere. There would be little benefit in having multiple PCs unless those characters were well defined, and their interactions with NPCs suitably varied. This requires enormous effort on the part of a game's authors if the different characters are interacting with the same people and places, since NPCs need different responses for each, and ideally location and object description would vary slightly too.

Wood (1996) contrasts the lack of multiple player characters in text adventures with the triad of player characters in LucasArts' *Day of the Tentacle*. Graphic adventures can communicate visually who the player is controlling and where the character is; their interface design fosters direct manipulation. Nevertheless, text adventures occasionally offer multiple player characters: at a certain point of *The Hitchhiker's Guide to the Galaxy* (1984), the player has to control the other main character of the game, Ford Prefect; in *Suspended* (1983), since your player character is in suspended animation, you are controlling six different robots in six different locations (Wood, 1996).

GRAPHICAL TEXT ADVENTURES

Graphical text adventures coexisted with text adventures until the mid-80s; in them, there would be an illustration for each location. The first graphical text adventure was *Mystery House*, released in 1980 by Ken and Roberta Williams. It had very basic line drawings to display the settings in most of the screen, and the text and prompt in the lower part of the screen. The illustrations helped the player see what the environment was like, though she could not interact with them – it was just a first step towards direct manipulation.

Specific player characters started to be more common with the advent of graphics, be it Bilbo (Melbourne House's *The Hobbit* (1983)); Arthur before he became king in Infocom's last adventure *Arthur: The Quest for Excalibur* (1989); Jim Hawkins in *Treasure Island* (1985), or *Dorothy in The Wizard of Oz* (1985) in Telarium's games. Somehow, providing a visual point of view helped construct a specific identity to the player character, which the player had to re-enact. Apart from the visuals, graphical text adventures offered the same type of parser as text adventures, the manipulation was still indirect so that they were plagued with the same problems, such as finding the right combination of words to solve puzzles, or find one's bearings in the gameworld.

Early Graphic Adventures: Sierra Onlines's AGI Engine

After setting up of the company Online Systems (later called Sierra Online), Ken and Roberta Williams went on to release more graphical text adventures. The breakthrough for Sierra came in 1984 with *King's Quest*. IBM commissioned a game that would make the best of the technical features of the new IBM PCjr.[7] The result was a new game engine called AGI (Adventure Game Interpreter), which brought about a new interface for adventure games. Most of the screen was filled with a graphical representation of the space the player character was in, as in textual graphic adventures, but the graphics were dynamic, and the player character could be directly manipulated with the arrow keys. The navigation was not limited from moving from room to room (or location to location), the player could now navigate within the screen. Maps would still be necessary, but not as indispensable as in text adventures. The manipulation of objects was still syntactical, and dependant on the command line at the bottom. Three of the commands (swim, jump and duck) could either be typed or selected through the game menu; these were the three intransitive verbs in the game (i.e., the commands that did not need an object to be complete). The AGI engine, as a transitional model, presents direct manipulation to navigate, helping the player situate her character in the space, but keeps indirect manipulation (by typing and using menus) to allow the player a greater range of possible actions.

Text was not eschewed from the interface – apart from the command line, the player would read the responses of the parser in a pop-up window in the middle of the screen, which would make time freeze in the diegesis while being read. This window gave more information about objects that could be examined, or messages from the parser telling the player that she could not do that, "at least not now!" indicating that the command was recognized but not successful. Descriptions would make up for the low resolution of the graphics (160x200 pixels, 16 colours). The text descriptions have remained in adventure games, handed down from IF (*Myst* and its acolytes excepted), even after graphics improved – they still include hints and pointers to advance in the adventure.

7 The ultimate AGI & SCI website http://www.classicgaming.com/agisci/agiinfo.shtml

The graphical user interface also meant that the different levels of interaction were now distinct on the display. The gameworld took most of the screen frame; the command line was outside the gameworld but visible along with it. In order to access the non-diegetic directives, players had to press a button (ESC), that would call up a menu for saving / restoring / restarting / quitting the game. The inventory was also accessed through this menu, situating it at a hypodiegetic level; in both cases, when the menu appeared, time stopped in the gameworld.

The distinction between diegetic / extradiegetic levels was also reinforced by the messages that appeared when the player character died: "We, at Sierra, wish to thank you for playing *King's Quest*. We are very sorry that you did not succeed and hope you will fare better next time. Good luck." This message calls attention to the fictive nature of the game, and to the people who created it.

Sierra's AGI engine resolved the ambiguous polyphony of IF by visualizing the different levels of interaction and making them distinct. The existing overlap between commands that could be typed or selected in the menu was a way to ease the transition from the conventions of text to graphic adventures.

The indeterminate player character was not used in graphic adventures. In spite of the low-res graphics, it is possible to identify who the player character is. The character was now distinct, so the player could establish a closer relationship with it through direct manipulation. The protagonists of graphic adventures were also usually associated with a narrative genre, and thus with a set of actions within a generic environment – *King's Quest's* Sir Graham lives in a fairy-tale world, Roger Wilco in *Space Quest* (1986) is a janitor in a spaceship.

The only feature that AGI or subsequent Sierra engines did not address was a dialogue system. The player could only choose which character to talk to, which would display a canned conversation, with no chance for the player to choose the topic of the conversation, so that "talk to" was therefore another form of examining an object (in this case a living entity) for information.

POINT-AND-CLICK: LUCASFILM/LUCASARTS SCUMM ENGINE AND SIERRA'S SCI ENGINE

Lucasfilm Games was the videogame subsidiary of Lucasfilm Ltd., created in 1982; it changed its name to LucasArts in 1990. It started making adventure games with the movie adaptation of Lucasfilms' movie *Labyrinth* in 1986. The company released *Maniac Mansion* the following year, which used the SCUMM game engine (Script Creation Utility for *Maniac Mansion*). This engine, and its subsequent versions, was used in all their adventure games until *The Curse of Monkey Island* in 1997.

The SCUMM engine presented a similar layout as Sierra's AGI, with the gameworld depicted on the top half of the screen. The difference was that at the bottom were listed the verbs that could be used in the game (no more, no less), so that the player did not have to guess which exact word would have

to be used, nor look at the word list outside the game. The list of inventory items the player character was carrying appeared next to the commands. The layout thus reinforced the mechanics of the game – on the one hand exploring the space, on the other, the verb + object mechanic. The extradiegetic level was kept out of the screen, as in the AGI engine – the directives could only be called with a function key (F5), which is also separated from the keyboard shortcuts of the game.

The main innovation of the SCUMM engine was that the only input method of the game was moving a pointer, either with a mouse or the arrow keys. The widespread use of the mouse in home computers soon made the point-and-click interface the most popular input device for adventure games.[8] The player moves the pointer and clicks over both the gameworld and the menus to make the desired command. Instead of typing, she can click on the verb list first, and then on the inventory or gameworld object she wants to use. The interface combined direct and indirect manipulation; the pointer moves analogously to the mouse, which constitutes direct manipulation, but the instructions to the player character are still syntactic. The way that the syntax is restrained is what makes the interaction easier: the player can only use the verbs and objects on the screen, and some actions are interpreted automatically for the player. For example, the act of clicking on the place of the gameworld where the player wants the character to go is interpreted as "Walk to."

The player character remained distinct, it could even refuse or complain about the commands instead of giving an error message. The parser of text adventures could be personified and be sarcastic (remember "I do not think the lantern would agree with that"); now the character on the screen can turn to the player and talk to her directly. Thus, the error messages from the parser became personified, sustaining the fiction of the gameworld.

The interaction is considerably simplified, diminishing the hair-pulling caused by trying to find the right word for what the player wanted her character to do, even if she knew what had to be done. On the other hand, giving the player the verbs that could be used, and reducing them, also favours the combinatorics of the verbs on the screen with the inventory or the gameworld as a valid mechanic to solve puzzles, instead of trying to use logic and/or come up with creative solutions.

LucasArts' graphic adventures had an effective – though not very sophisticated – menu-driven dialogue system. Most times, the user just had to go through every single option in the menu to have all the possible conversations. Though this is still canned dialogue, at least it gave the chance to choose what to say, as well as providing the basis for one of the most ingenious mechanics to make your character "learn." In *The Secret of Monkey Island*, the player character Guybrush Threepwood has to learn how to sword-fight; the secret to win is not being skilful, but being good at insulting your opponent to undermine their confidence. Guybrush must learn all the insults and their respective comebacks; he has to fight pirates, and let him-

8 This also facilitated porting these games to consoles, since the keyboard input had made adventure games an exclusively home computer genre.

self be insulted and beaten, to then have those insults appear in his dialogue menu, then he uses the insults with other pirates to learn the replies. Thus the player has to earn each possible line of dialogue by fighting in order to become a sword master.

Later versions of SCUMM reduced the number of verbs (Give, Open/Close, Pick Up, Look at, Talk to, Use, Push/Pull), and included a context-sensitive cue, so that the verbs that could be used with a certain object would be highlighted when the mouse hovered over it. On the other hand, these cues also curtail the range of actions possible in the game. Usability finished off one of the basic premises of text adventures, which was giving apparent freedom of agency to the player.

The reduction of usable verbs came to a minimum both in the Sierra and LucasArts engines in the early 1990s. Sierra's SCI (Sierra Creative Interpreter), which substituted AGI, introduced the point-and-click system with *Leisure Suit Larry III* (1989), and eliminated the command line. The verbs were reduced to Walk, Look/Examine, Use / Pick up, Talk, selected inventory object and access inventory. The SCUMM engine also changed the interface in *Sam 'n Max Hit the Road* in 1993, leaving out menus, letting the gameworld fill up the screen, and reducing the commands to basically the same list. The syntactic commands disappeared, and though the manipulation of the pointer was direct, the actions in the gameworld were still indirect. This again enhanced the usability of the game, but it also reduced most of the verbs to "use." Verbs were represented by icons instead of words, so that they referred to as many related actions as possible. Some games would still have actions that were character-specific, for instance, Sierra's Leisure Suit Larry would have a kiss and zipper icon (whose meaning would change depending on context); Ben, the protagonist of LucasArts' *Full Throttle* (1995), could kick (which is essential if you are the leader of a motorcycle gang). These special actions helped define the character, though they were also rare.

Myst's minimalistic interface

Cyan Worlds' *Myst* was released in 1993 – just as both Sierra and LucasArts were refining their point-and-click interfaces – and revolutionized adventure games. It had beautifully rendered landscapes filling the screen, as well as a context-sensitive point-and-click interface. The game invited the player to explore a fantasy environment at leisure, pacing down adventure games even more. The game also slowed down considerably due to the absence of NPCs to interact with,[9] avoiding awkward behaviours that would shatter the illusion of being immersed in the fictional world. The lack of NPCs, as well as the first person point of view, took the identity of the player back to the indeterminate protagonist of most text adventures. There was no inventory, though the player could take some objects from one location to another. On the other hand, the point-and-click interface allowed direct manipulation, pushing but-

9 There would appear occasional NPCs in later instalments of the saga, though the player still could not interact with them.

tons, or dragging objects by moving the mouse. *Myst* incorporated in its interface most of the features of direct manipulation, as proposed by Shneiderman – ease of use, visual representation of the objects to be manipulated, "rapid, reversible, incremental actions," whose form of input was in some form analogous to how those actions were performed in the real world; the whole system made error messages such as "you can't do that" superfluous (Shneiderman, 2003). All these elements favoured the feeling that the player was actually in the gameworld, as well as attracted new players who preferred not to act as the default player character in graphic adventures. There were no descriptions of objects, which may have broken the illusion of physical immersion, though there was still a good amount of reading. The player had to reconstruct the backstory of the gameworld he had been thrown into by reading books and notes scattered over the different locations.

Myst offered an enticing environment, which solved many of the frustrating issues of adventure games simply by avoiding them. The *Myst* series certainly revolutionized adventure games in many ways, especially by following the tenets of direct manipulation. It was also so minimalistic that it became very difficult to change the interface model without expanding it. By leaving out all verb mechanics, it eliminated the cornerstone of earlier adventure games, which was verb-oriented agency through a wide range of actions. For almost a decade after the release of *Myst*, adventure games wavered between re-hashing the Sierra/LucasArts model of interaction (*Broken Sword: The Shadow of the Templars* (1996)) and *Myst*-like environments (*Syberia* (2002); *Aura: Fate of the Ages* (2004)). There are honourable exceptions, such as *Bad Mojo* (1996) where the player character is a cockroach and navigation is the only control available, and *The Last Express* (1997), another point-and-click adventure which made a brave attempt to incorporate real time into adventure games.

ADVENTURE GAMES FOR THE NEXT GENERATION CONSOLES: GESTURAL INTERFACES

The adventure game genre is still a predominantly home computer genre. Only some of the LucasArts titles were released for consoles; the rise of videogame consoles during the 1990s could also account for the steady decrease of adventure games sales. Also, though it has taken time for console-type controllers to latch on with home computers, games are increasingly optimizing their controls depending on which peripheral the player is going to use. Current interface innovation in adventure games is now propitiated by the incorporation of game controllers to PCs, as well as new input devices in consoles, such as touch screens.

The game *Farenheit* (Europe) / *Indigo Prophecy* (US) (2005) attempted to design a new interface for adventure games based on the game controller. Presented by its developers as "interactive drama," they admit that it belongs to the adventure game genre (McDonald, 2005). The interface evokes a movie being shown on television, with black bands along the top and bottom of the screen. The player needs a game controller with two analog sticks to play –

with one she will move the selected player character, with the other she selects the action she wants the character to perform, in the form of a movement/gesture. These actions are always determined by context, and the way the player performs them is by moving the analog stick in a way that imitates what the character will do. For instance, in a kitchen she has to move the analog down to open a fridge, or up to push a cupboard. If the action is an effort the character had to make, the player also had to make an "effort" with the controls; for example, pushing the left and right shoulder buttons alternatively, rhythmically and fast to run or swim. In all these cases, this gestural interface follows the tenets of direct manipulation by trying to make the movements in the controller imitate the actions in the game, as well as by giving visual cues to the player to how to perform gestures in the form of animated icons.

Farenheit / *Indigo Prophecy* does not particularly encourage exploration of the space – the puzzles are time-sensitive, so that if the player takes too much time in one location, for instance, the player character may be caught by the police and the game will be over. On the other hand, it encourages replay to solve a problem. For instance, in the opening scene, the player character has just killed a man for no apparent reason. The player can opt to go out covered in blood and be immediately identified as the prime suspect, or wash himself, hide the body in a cubicle and wipe the floor, to buy some time before they find the corpse. This brings back the exploration of possible actions that characterized text adventures, and is also the basis for the overall structure of the game, by which there are multiple ways to traverse the game by choosing different actions.

The gestural interface of *Farenheit* / *Indigo Prophecy* brings back many of the essentials of adventure games. Though the gestures themselves turn repetitive after playing for a while, it brings back the illusion of agency in the world by offering at least two or three possible actions per active area.

Interactive drama seems to be the next offshoot of adventure games with games such as *Farenheit* / *Indigo Prophecy*, as well as experimental videogames such as Mateas and Stern's *Façade* (2005). The move into direct manipulation is even more evident in this last case, because it has been adapted to use Augmented Reality interface (Dow *et al.*, 2007). In Augmented Reality the interactor sees the characters superimposed on an actual room through a head-worn display, and interacts with them by walking around, making hand gestures and talking.

Interfaces encouraging direct manipulation of the gameworld keep appearing in adventure games, as was the case of *Another Code* (Europe) / *Trace Memory* (US), for Nintendo DS. In order to solve some of the puzzles of the game, the player has to blow off dust by blowing on the console's microphone, "scratch" surfaces with the stylus, and even close down and open the DS again to use an ink stamp. As Marek Bronstring (2006) remarks, these are novelty puzzles, whose novelty will wear out as more games use these gestural mechanics – what is interesting is how they turn everyday actions into a fun activity, and how they encourage game designers to come up with new ways to use the physicality of the controller.

CONCLUSION

Throughout this chapter, we have observed the evolutional search of direct manipulation in adventure games. Giving the player cues about what to do and facilitating the input are first steps to facilitating the illusion of immersion in the gameworld. Error messages, which remind the player of the program behind the game, disrupt this illusion. On the other hand, making error messages dramatic, as in having the player character refuse to do what the player commanded, is a way to ameliorate this disruption.

In the process of transformation of the adventure games interface, we see how new models do not automatically cancel out previous ones. Each interface –textual, menu-driven, point-and-click, gestural – has its strengths and weaknesses in relation with the different features that characterize adventure games. The choice of what interface model will be used may depend on the type of experience the designer wants to create for the player. A good example of this is Nick Montfort's *Ad Verbum* (2000), an interactive fiction piece where the challenges are based on riddles and puns. Some of the puzzles are entirely based on words, as in some rooms where all the descriptions start with the same letter (e.g. "s"), and the commands must start with the same letter in order to be effective.

Adventure games are still being released using old engines in non-commercial or independent games. There are thriving communities of amateur adventure game developers, using for instance Inform, a programming language to make adventures for the Z-Machine, developed by Graham Nelson (Nelson, 2001) or Adventure Game Studio, a development environment for point-and-click adventure games. Even though adventure games are usually not released as AAA commercial games any more, they are still very popular in Europe, where new games are still released every year by companies such as Péndulo Studios in Spain, or MC2-Microïds in France. In Japan, the genre is known as "visual novels," and has always been alive and kicking, with series such as *Phoenix Wright* (2005), originally released for GBA and now remade for the rest of the world for the Nintendo DS. In the US, where most of the engines listed above were developed, adventure games are now seeing a revival with companies such as Telltale Games, which not only develop their own adventure games, releasing them as instalments, but also have started distributing European adventure games.

Adventure games also hold strong ties with less commercial, innovative forms of digital storytelling and electronic literature. The versatility of the adventure games genre is remarkable – from commercial to fan development, from games to experimental storytelling. Contrary to popular belief, the genre of adventure games is still alive and seeking innovation in game design, as well as in constructing fictional worlds.

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Augmented Reality Games

INTRODUCTION

Electronic games are a kind of computer application that has avid demand for innovation and for more engaging user experiences. So far the main focus of improvements in electronic games has been on graphics; more recently artificial intelligence has been drawing more attention from researches and developers. But what does the future hold for the gaming experience? A good way to foresee the future of game interfaces is to look at what research labs are doing now – and one technology that is starting to boom in labs and scientific conferences dealing with game technology is known as Augmented Reality. With this technology, it is possible to merge real and virtual elements, either by allowing users to appear in the game's virtual environment, or by projecting virtual objects or characters in the real world. The appeal of this kind of interface is enormous, as it provides the possibility of combining the advantages of physical games with the magical flexibility of digital virtual worlds. On the other hand, challenges such as cost, space requirements and the very risk of introducing a new technology to the consumer market may delay its adoption. This chapter presents Augmented Reality technology and discusses the potential of applying it to electronic games. Some experiments and prototypes, which exemplify what the future games may look like, are also presented.

AUGMENTED REALITY

Augmented Reality (AR) is a new approach for virtual environments. It combines virtual and real elements instead of totally replacing the real space by a virtual one, as is the goal of Virtual Reality (VR) applications. In AR, unlike VR, immersion is not always a major concern, since the user is often already immersed in the real environment being augmented and this augmentation may be clearly non-immersive (for instance, projecting an electrical diagram on top of a real circuit). That is why immersion is not part of AR's definition despite usually being in VR's. "An AR system supplements the real world with virtual (computer-generated) objects that appear to coexist in the same space as the real world" (Azuma *et al.*, 2001, p. 34). As pointed by Bimber and Raskar (2005) the simple integration of synthetic information into real

environment is not sufficient to characterize an application as AR, otherwise we would consider a movie theater as an AR environment. In fact, to be AR, a system must also have the following properties:

- Real-time interaction and
- 3D registration (alignment) between real and virtual elements.

Registration is to establish the relationship between the coordinate systems of different objects, so that they can be transformed to a single one. It is very important in AR because there are always at least two coordinate systems that must coexist, the one describing the positions of real world objects and the one for virtual objects. Registration can be a complex problem, depending on the technology used to solve it, involving the tracking in 3D and correct identification of real and virtual objects and the correct positioning of these objects together.

Bimber and Raskar (2005) use a classic science-fiction movie, *Star Wars*, to exemplify augmented reality by referring to the scene in which R2-D2 projects Princess Leia asking for help. But this is not a good example, as it does not comply with the two requirements listed above. It would be an excellent example of AR if other movie characters could talk and interact in real time with Princess Leia and if her projection could walk in the real environment while avoiding collision with elements in it.

Here are a few examples of AR systems:

- the presentation of interactive multimedia information spatially aligned with a work of art observed by the visitors of a museum;
- a real book that projects interactive 3D images as its pages are turned;
- a real desktop in which one can interact with real and virtual projected objects simultaneously;
- a system that projects a real-time, mixed video of the real world and virtual 3D objects in a head-mounted display utilized by the user, who can walk in and interact with the environment;
- a game in which players see their images projected in a 3D virtual environment and interact with game objects and characters.

Some authors prefer to use the term Mixed Reality (Milgram, Takemura, Utsumi & Kishino, 1994) as a general concept, subdividing it according to the proportion between real and virtual. These subdivisions are: *Augmented Reality*, when some virtual elements are superimposed on real environments; *Augmented Virtuality*, when some real elements are introduced in a virtual environment; and *Mixed Reality* itself, when virtual and real elements are in close proportions. That classification, although easy to understand, does not work very well in all situations, so in this text the term Augmented reality will be used for all systems that mix real and virtual environments, and comply with the requirements of real-time interactivity and 3D registration.

Spatial Augmented Reality

An alternative to conventional augmented reality is Spatial Augmented Reality, where video projectors, optical elements, holograms and tracking technologies replace the use of hand-held or head-mounted displays (Bimber & Raskar, 2005). One of the motivations for spatial augmented reality is the fact that, in many cases, the users do not have to wear or carry special devices to use the application.

Bimber and Raskar (2005) distinguish three categories of displays that can be used for spatial augmented reality: screen-based video see-through displays, spatial optical see-through displays and projection-based spatial displays. Screen-based video see-through displays make use of one or more standard video monitors and video cameras. Images of the real environment are merged in real time with those of virtual objects and presented on the screens. Despite the ease of implementation, this solution has a number of disadvantages, such as limited sense of immersion, for when such a sense is desirable, and limited resolution of the mixed images (in contrast with the surrounding environment). Furthermore, implementation of direct interaction techniques is difficult, if at all possible, with these displays.

Spatial optical see-through displays may use large semitransparent screens or other devices such as mirror beam splitters mounted in the real environment. Virtual 3D images are optically combined with the view of the real environment in these devices, giving the impression that the virtual objects are in the real world. Although these displays present better resolution and field of view than the monitor-based ones, they also have limitations. One of the most significant is the difficulty to support multiple simultaneous viewers.

Lastly, projection-based spatial displays employ video projectors to present images directly onto the surface of real objects. This technique allows the modification of the visual properties of object surfaces. The problems related to these displays include the difficulty to maintain the correct registration to the object onto which the projection is applied (especially since the object might even have no flat surfaces, much less surfaces perpendicular to the direction of projection) and the artifacts caused by shadows from the user or other objects. Furthermore, the display area is limited to that of the objects being used as projection surface.

Although the most appealing spatial augmented reality techniques are relatively difficult to implement and have limitations, they also present interesting possibilities in the context of AR games. For instance, projection-based displays coupled with tangible interface techniques may allow the creation of a highly interactive environment such as the application illustrated by Raskar and Low (2001). One point to notice about all of the spatially augmented reality techniques is that they require considerable physical space dedicated to a setup of video projectors or other hardware. Hence, it can be expected that games using these techniques might not find a way into home entertainment systems. In a short term a more feasible scenario for such games would be that of amusement parks or other dedicated venues. In the near future, however, it

is expected the availability of low cost portable projectors, which can potentially reduce space and setup requirements.

Human Factors

AR systems involve new technologies and some special devices bringing new problems and issues to be considered. Of great importance are issues related to human factors, most of them caused by AR displays. According to Azuma *et al*. (2001), some of the most significant human factors in AR systems are:

- *AR Display issues:* mis-calibration, visual accommodation issues, HMD (Head-Mounted Display) limitations; besides these, some more may be added, such as environment illumination, display resolution, user discomfort (in case of wearable displays);
- *Latency:* system delay can cause registration errors and reduce user performance;
- *Depth perception:* stereoscopic displays still have problems, such as resolution, visual accommodation issues, dependence on the user position, mismatch between stereographic frames[1] etc.;
- *Adaptation:* AR equipment can demand some adaptation by the user, especially the wearable ones, such as HMD, that can impact human performance;
- *Fatigue and Eye Strain:* some kinds of AR display, especially HMD, are not suitable for long-term use.

Tangible User Interface

The concept of Tangible User Interface (TUI) was defined by Ishii and Ullmer (1997) as a Computer-Human Interface which uses interactions with the physical world as metaphors of information manipulation in the virtual world. In these interfaces, a physical and a virtual object are associated so that changes in one (usually the physical) should affect the other. This allows the user to manipulate the virtual objects in 3D through touch and manipulation of a real object in a very natural manner.

In TUI applications, it is important to keep registration between physical and virtual objects. There are many ways to accomplish this, but one common solution is the use of fiducial markers. A fiducial marker consists of a distinctive visual marker that is placed on an object to be tracked through a video camera. The camera images are processed through computer vision techniques to locate the marker and determine its position, so that the physical object and its virtual counterpart can be aligned.

One example of this interface in use is presented by Underkoffler and Ishii (1998), in an application called *Illumination Light*. In this application, the user can directly manipulate physical objects representing mirrors, lasers, lenses and other optical components on an augmented surface. When, for example, a user places the object that represents the laser emitter on the sur-

1 Stereographic frames are a pair of images produced as if they were seen by the right and left eyes. When each image is shown (through a variety of techniques) only to the matching eye, the brain registers a sense of depth

face, the system detects its position and projects a virtual light beam directly from the object. Another object that represents a mirror can be located in such way that it reflects the light beam to a desired position, and thus it is possible to manipulate the other components to get the desired effect. Further in this chapter, several other examples of tangible interfaces in games will be shown.

By means of tangible interfaces, manipulation of digital information becomes more intuitive and natural, as in the example of rotating a real object to get the same movement in a three-dimensional digital model. Compare this to using a mouse to select the virtual object and then using some complex interface to rotate it in three axes. Tangible interfaces also allow and even stimulate collaboration between users by allowing movement and interaction with fewer constraints, with both hands and even the body. The "ownership" of a virtual object, for instance, can be instantly determined by seeing which user holds its physical correspondent. Brave, Ishii and Dahley (1998) make use of tangible interfaces for Computer Supported Collaborative Work applications with remote communication. One such application is called Synchronized Distributed Physical Object and creates the illusion of physical objects, representing some virtual content, which are shared by remote users, through a system that synchronizes the position of these objects in accordance with user manipulation.

In environments with Augmented Reality, the relation between virtual objects and the real world is very close, which makes tangible interfaces one of the best and most natural forms of interaction. Tangible Augmented Reality (TAR) is defined by Billinghurst, Grasset and Looser (2005) as an approach to AR applications that integrates the virtual content and one or more tangible physical interfaces, so that each virtual object is registered to a physical object and users can interact with this virtual world by manipulating corresponding physical objects. Some of its basic principles, based on TUI, are:

- The use of physical controllers for virtual content manipulation;
- Support for spatial 3D interaction techniques;
- Support for both time-multiplexed and space-multiplexed interaction;
- Multi-Handed Interaction;
- Matching of interface allowances to task requirements;
- Support for parallel activity where multiple objects are being manipulated;
- Collaboration between multiple users.

For tangible interfaces to become intuitive and seamless, with no need of training for their manipulation, it is necessary to choose physical objects that are already well-known to the targeted users and also make use of metaphors that appear natural to these users, thus eliminating the need to learn new ways of virtual interaction, as users only have to rely on abilities naturally developed during the course of their lives.

An example of a game using TAR is presented in Bernardes, Dias, and Tori (2005), where the fiducial markers are physical objects that represent the

circles or the Xs, in a tic-tac-toe game between two players. These markers are used to directly move the pieces to the desired position.

There are many applications and researches related to games that make use of tangible interfaces. Some commercial electronic games have already employed this kind of interface, in the form of pistols, pedals, wheels and even bongo drums. Not all uses of these unconventional controllers constitute a tangible interface, since the controller is not always uniquely mapped to a virtual object (actually, it is usually not), but in some games unconventional controllers have been used in tangible interfaces. Nintendo has gone a little beyond this with its portable console, Nintendo DS, and its touch-screen. Its new console, Wii, is even more likely to popularize this type of interface through the ability to track user movements through a wireless controller. In the electronic game *Wii Sports*, for instance, the Wii control can be used as one tennis-racket or as a baseball bat.

PLAYING IN AUGMENTED REALITY

Back in 1997, entertainment was already mentioned as one of the main applications of AR. At that time, however, it was mainly used in a few film productions by the movie industry, to allow the actors to see and interact with virtual elements in real time, which would later be inserted in the movie (with much better quality) through the chroma key technique, for instance. It is clear that the technology then did not allow AR applications with real-time interaction (one of the requirements in AR definition) at a reasonable cost in Video Games.

Four years later, Azuma *et al.* (2001) already consider electronic games an important area for AR and mentions several examples, such as *RV Border Guards* (Ohshima, Satoh, Yamamoto & Tamura, 1999), *AR Air Hockey* (Ohshima, Satoh, Yamamoto & Tamura, 1998) and *Augmented Pool* (Jebara, Eyster, Weaver, Starner & Pentland, 1997). Bernardes *et al.* (2005) list several other applications, including simple applications already commercially available (for instance, EyeToy games for PlayStation 2). Seventh-generation consoles such as the XBox 360 and Playstation 3 have the necessary computing power for image processing operations needed by AR without severely harming game performance. This, coupled with the promise of digital video cameras for those consoles, may allow the creation of a new generation of AR console games.

The increasing applications of AR in games and the search for solutions to combine the two can be clearly seen when comparing these scenarios of 1997, 2001 and 2005. A trend can be noticed towards camera-based augmented reality games, as it presents lower requirements in terms of cost and physical space. Analyzing the existing research in these years and its evolution, as well as what it is commercially available, one also notices that many of these technologies are still in their first steps, with considerable room for evolution.

AUGMENTED REALITY GAMES

One of the trends that can be observed when analyzing the evolution of augmented reality games since 1997, besides those caused by technological improvement, is the increasing number of games and the great variety in which they are presented. This variety is often reflected in the technologies used for each type of game. It is thus necessary to consider a classification of the games before discussing them individually.

The main classification proposed for augmented reality games in this work is based on the physical space demanded by the game, separating games that require large areas from the ones that need limited and prepared areas, and others that use the advantage of the natural mobility of devices such as cell phones and PDAs and are independent of the area in which they are played.

The game's metaphor can be used as a secondary classification criterion of AR games, without a correlation as close to the technology used in its implementation as the gaming area. In this work, the metaphor of an AR game is defined as the type of game (traditional or electronic), object or activity that serves as a basis of inspiration, comprehension and comparison for the playability of AR games, i.e. the way they are played. The main metaphors described in this work are the physical metaphor, sports, board and card games and even "traditional" videogames. Games with less common metaphors, such as music, are also presented.

Classification by Gaming Area

The size of the area where an augmented reality game is played have great influence not only on its playability but also on the technology used for its implementation.

Games designed for relatively large areas (often called "outdoor" games, although they do not necessarily need to be played in open environments), such as a city, a university campus, or a large building, depend on wearable computers (currently they are carried as a backpack by the players) to process the game data, handle input and output and communicate with other players or a game server. This communication also becomes an issue in large-area AR games as current wireless technologies present range limitations that must be taken into account. The graphical output is usually carried out through head-mounted displays (HMDs), which are portable and constitute a more viable alternative than placing several monitors or projectors throughout the large gaming area. These HMDs are usually of the semitransparent type, for security reasons. One of the most complex problems in augmented reality, registration, becomes even more challenging in outdoor games and frequently the combination of several registration techniques is necessary to overcome it. Previous knowledge of the environment, either in the form of a 3D model or 2D map, as well as the use of GPS is always found in the implementation of these games, usually assisted by computer vision techniques, or movement and orientation sensors.

Games designed for smaller and well-demarcated areas, however, can make use of different options of technology for their implementation. While HMDs are still common, the composition of real and virtual images by video is as common as the optic composition of semitransparent HMDs. In contrast with outdoor games, monitors and projectors in a variety of configurations are also widely used. It is rarely necessary to make use of portable or wearable computers and registration can be achieved with less complex solutions, usually requiring only the use of a single technique (often computational vision, with cameras in fixed and known positions, but other techniques such as position trackers are also used). Moreover, the game usually makes use of some environment element, such as a table, boxes placed on a grid drawn on the floor, a wall with a constant and known color or background image etc.

A third type of AR game involves mobile devices and does not depend on the place where it is being played. This independence is what characterizes this type of game, and not simply the use of mobile devices, since they can also be used in other kinds of game.

Regarding playability, the physical metaphor prevails in AR games for large areas. Thus, in order to run or to jump in one of these games, the player must physically run or jump. To change his point of view, he moves or turns his head. One of the main motivations for these games is exactly to bring a video game to the real world and to interact with the game in a new, physical way. It is not by chance that classic electronic games, like *Quake* and *Pacman*, have served as inspiration for the two most widely known outdoor AR games. Games for smaller areas and area-independent games, on the other hand, are presented in several different metaphors, as will be seen ahead.

The next three sub-sections summarize the research and projects involving AR games, from 1997 to 2005.

Large Area AR Games

The main AR games of this type are *NetAttack* (Fraunhofer, n.d.), the *Human Pacman* (Cheok *et al.*, 2004) and *ARQuake* (Thomas *et al.*, 2002a). All of them use semitransparent HMDs (and therefore optical merging of real and virtual images), wearable computers, GPS and wireless communication.

NetAttack's scenario consists of the invasion of a computer system by hackers (the players), who must collect items and clues to reach their objective while bypassing the system defenses and competing with each other. It is a little ironic that, in this case, part of the real world is used to represent a virtual world (the system that is being invaded) instead of the opposite. The players are divided into different two-member teams. The players of each team collaborate in the following manner: one of the members uses the augmented reality interface and explores the game environment, while the other, using a conventional desktop interface, has access to more information about the game environment (mapped in 2D), and assists and guides the first. GPS registration is assisted by the use of computer vision with fiducial markers and by a sensor to detect head orientation. The only form of interaction

presented in the game is through the collision between a player and a virtual object.

The *Human Pacman* is based on the classic *Pacman*, with human players in the roles of both the game main character as well as of the ghosts that pursue it. The digital labyrinths of the original game are replaced by a real environment, but the capsules that the Pacman eats remain virtual. The registration is made through movement and orientation sensors, as well as GPS and a 2D map of the environment. The ghosts "kill" the Pacman by tapping on his shoulder (the touch is registered by a sensor) and the "vitamin" that allows the Pacman to "eat" the ghosts is a tangible interface, a physical object with Bluetooth transceivers that must be physically picked up and carried once found to benefit the player for some time.

In *ARQuake*, as in the original game, the player moves inside a real environment and can choose between several weapons to shoot and eliminate the "monsters" he meets. New weapons and other items that give advantages to the player can be found in the environment.

In contrast with *NetAttack* and the *Human Pacman*, *ARQuake* uses a 3D model of the game area, allowing it to make the correct occlusion of items and monsters by environment elements, such as buildings (which does not occur in the other two games). Registration is made by GPS, computer vision with fiducial markers and a sensor for head orientation. The game only allows the interaction between two players, one with the AR interface and one using a personal computer and the game conventional interface (with the pre-made maps of the real environment). Thomas *et al.* (2002a) observe that the player with the conventional interface always wins, because he can move with more agility than the player with the AR interface. The interaction with the game is made through collision detection and the use of a "weapon" – a device with two buttons and haptic feedback that does not need to be pointed at the target. As in *Quake*, the shooting direction always coincides with the player's gaze direction.

ARQuake developers made an interesting study to determine which combinations of color and intensity were more appropriate, not only to make the game elements more visible when inserted in the real environment, but mainly to give a better impression of opacity when projected in semitransparent HMDs. The original textures of the game objects were replaced by others using the colors selected for better visibility and opacity, allowing a certain form of occlusion of real objects by the virtual ones. This occlusion in semitransparent HMDs would usually demand specialized hardware, such as the system described by Kiyokawa *et al.* (as cited in Azuma *et al.*, 2001).

Another interesting aspect of *ARQuake* is the research that was made about its playability (Thomas, 2003) and usability (Thomas, Krul, Close & Piekarski, 2002b). These works discuss problems such as: the choice of the field of view; the instinct of the users to catch virtual objects with their own hands (instead of colliding with the object, as the game requires), which causes frustration; the effects of virtual walls, doors, soil or sky in the game; the aversion to the shades generated under game objects; and other problems related to playability and even safety.

Part of the team responsible for the development of *ARQuake*, along with private investors, are developing the hardware and an engine for arguably augmented reality games (A_Rage, 2005). Although the A_Rage system combines real and virtual elements through a semitransparent HMD and has real-time interaction through a gamepad; there is no 3D registration between real and virtual objects, not satisfying Azuma's definition of Augmented Reality (1997), adopted in this work.

Limited Area AR Games

Because most AR games fall into this category, this section is organized differently. The games are divided by metaphors and their main technical details are presented in tables 1 to 4, which include the bibliographic reference for each game, where more information can be found. Only the most relevant details of the games are presented in the text. The tables group the games in the following metaphors: board games, sports, physical metaphor and other games that do not fit the previous metaphors.

In tables 1 through 4, simple projection means projection without the use of Spatially Augmented Reality techniques (SAR) and non-tangible interaction means the direct manipulation of virtual objects, by the user's "touch", without a real object to be manipulated as in tangible interfaces.

TARBoard, listed in Table 1, interestingly mixes the metaphors of board and card games (in a similar way to a well-known animation series). Starner, Leibe, Singletary and Pair (2000), on the other hand, present a game that places players using a tangible interface against one with an interface based on gestures and voice recognition. They relate an unexpected fact: the gesture-based interface proved so much better than the tangible one that it was necessary to have two players manipulating the tangible pieces to match only one using gestures and voice.

Jumanji Singapore (Zhou, Cheok, Chan & Li, 2004) has both augmented and virtual reality interfaces, allowing the user to alternate between the two.

Magerkurth, Engelke and Memisoglu (2004); Barakonyi, Weilguny, Thomas and Schmalstieg (2005) and MacWilliams, Sandor, Wagner, Bauer, Klinker and Bruegge (2003), besides presenting the games mentioned in Table 1 and their implementation, also present the software frameworks with which these games were developed, the platform AIMS/CATS/STARS (Magerkurth, Stenzel, Streitz & Neuhold, 2003), StudierStube and DWARF, respectively.

In the last three games of Table 1, a question mark follows the forms of image composition and registration because these games, although classified as augmented reality applications by the authors, do not present any real element, only virtual ones. In the last two, the player sees part of the real environment due to the semitransparent HMD, but except for this, the positioning of the board on a real surface and the tracking of the player's head do not provide a combination of real and virtual elements or registration between them in the application, making their classification as augmented reality arguable.

Likewise, the *Virtual Catch Ball* in Table 2 is a purely virtual environment. The application "Sports over a Distance" does not augment reality with any virtual element, except for "glass panels" on the wall, which can crack but do not have 3D registration. Therefore, it is almost an application of collaborative teleconferencing, instead of augmented reality.

The augmented pool game with trajectory information (Jebara *et al.*, 1997) has an uncommon characteristic in indoor games, the use of wearable computers.

Name/reference	Display/merging	Registration	Interaction
KnightMage, CandyLand, Monopoly/ Magerkurth *et. al.* (2004)	Monitor (Presentation Manager)/video	Computer vision (limited), RFID, magnetic sensors	Tangible (RFID pieces), PDA
Herding Sheep/ MacWilliams *et al.* (2003)	Simple projection, monitor (laptop, PDA), HMD/video and optical	Computer vision (ART's DTrack tool)	Tangible (the "lure"), non-tangible, voice and pointing, PDA, laptop
Monkey Bridge/ Barakonyi *et al.* (2005)	HMD/optical	Computer vision or magnetic tracker	Tangible (fiducial markers or magnetic "puck")
False prophets/ Mandryk, Maranan, & Inkpen (2002)	Simple projection/optical	Diodes and infrared sensors	Tangible (game pieces with infrared diodes)
AR Mahjong/ Szalavári, Eckstein & Gervautz (1998)	HMD/optical	magnetic sensors	Personal interaction panel (Szalavári & Gervautz, 1997)
? /Ulbricht and Schmalstieg (2003)	HMD/optical	Computer vision	Tangible (fiducial markers)
Jumanji Singapore/ Zhou *et al.* (2004)	HMD/video	Computer vision	Tangible (cubes with fiducial marks)
Kanji Learning/ Wagner & Barakonyi (2003)	Monitor (PDA)/video	Computer vision	Tangible (fiducial markers)
TARBoard/ Lee, Woo & Lee (2005)	Monitor/Video	Computer vision	Tangible (cards, board)
MIND-Warping/ Starner *et al.* (2000)	Simple projection on the game board or HMD/ optical	Perceptive Workbench (vision and infrared) or radio	Tangible (pieces) or gestures and voice
Chinese checkers / Cooper, Keatley, Dahlquist, Mann, Slay & Zucco (2004)	Monitor/?	Computer vision?	Tangible (fiducial markers with buttons)
ARWorms/ Nilsen *et al.* (2004)	HMD/optical?	Computer vision?	gamepad, gaze
TankWar/Nilsen & Looser (2005)	HMD/optical?	Computer vision?	gamepad, gaze

Table 1. Indoor Games: Board Games Metaphor

Name/reference	Display/merging	Registration	Interaction
AR2Hockey/ Ohshima *et al.* (1998)	HMD/optical	Magnetic head tracking and computer vision	Tangible (mallets)
Sports over a Distance/ Mueller & Agmanolis (2005)	Simple projection/video?	Computer vision	Tangible (ball)
Golf Simulator/ Govil, You & Neumann, (2000)	HMD/video	Computer vision	Tangible (club, ball)
AR Bowling/ Matysczok, Radkowski & Berssenbruegge (2004)	HMD/video	Computer vision, dataglove and magnetic sensor	Non-tangible (ball)
AR Billiards/ Jebara *et al.* (1997)	HMD/video	Computer vision (color)	Tangible (the billiards game)
Virtual Catch Ball/ Jeong, Hashimoto & Makoto (2004)	Simple projection (cave)/ video?	SPIDAR-H (sensor and actuator system with wires)	Non-tangible (ball)
Ping Pong Plus/ Ishii, Wisneski., Orbanes, Chun & Paradiso (1999)	Simple projection/optical	Sound	Tangible (the ping-pong game)
CamBall/ Woodward *et al.* (2004)	Monitor/video	Computer vision	Tangible (pad)
SENAC AR Hockey/ Vieira, Trias, Theodoro, Miranda & Tori (2006)	SAR	Computer Vision (infrared)	Tangible (pads)

Table 2. Indoor Games: Sports Metaphor

Touch Space, in Table 3, is another application combining augmented and virtual reality, as well as *Jumanji Singapore*. In the same table, *Kick Ass Kung Fu* is a 2D game, but since it has 3D registration, it can still be considered an AR application. A curious detail about *AR PushPush* is that it is a game about pushing boxes, but instead of doing it through a tangible or non-tangible interaction with the virtual boxes, it uses simple gestures. It is also interesting to notice that, besides the physical metaphor, all the games of Table 3, as well as the outdoor ones that use the physical metaphor, also make use of the video game metaphor in the definition of the game subject and appearance.

The games in Table 4 show other metaphor possibilities. *Invisible Train* is inspired in classical trains and railroads toys and, even though it uses portable devices, it depends on the playing location, which has the "tracks" and fiducial markers. *Glass Xylophone* is a musical game and one game makes use of interactive storytelling.

Despite the varying metaphors used by these games, it is interesting to note the prevalence of computer vision-based registration techniques and tangible interfaces among them. This can be partially explained by the spatial constraints of the games, which make those techniques suitable. *Robot Arena* is not actually a game, although a simple prototype has been implemented as

a proof of concept, but is rather a platform for building similar applications and games, using SAR and computer controlled robots, both real or virtual, in an augmented environment.

Name/reference	Display/merging	Registration	Interaction
RV Border Guards, AcquaGauntlet/ Ohshima *et al*. (1999)	HMD/optical	Magnetic sensors and 3D environment map	Gestures
Bladeships/ Takemura, Haraguchi & Ohta (2004)	HMD/optical	Magnetic sensors (hand and head) and 3D environment map	Non-tangible (the bladeships)
Kick Ass Kung Fu/ Hamalainen, Ilmonen, Hoysniemi, Lindholm & Nykanen (2005)	Simple projection/video	Computer vision	Non-tangible (opponent)
Touch Space/ Cheok, Yang, Ying, Billinghurst & Kato (2002)	HMD/video	Magnetic sensors and computer vision (fiducial markers)	Gamepad, position and co-localization, tangible (boxes)
AR PushPush/ Kim, Lee, Park, Woo & Lee (2005)	HMD/video	Computer vision (fiducial markers)	Gestures
Camera Kombat/ Paula, Bonini & Miranda (2006)	SAR or monitor/optical or video, respectively	Computer Vision	Gestures

Table 3. Indoor Games: Physical Metaphor

Name/reference	Display/merging	Registration	Interaction
Invisible Train/ Wagner, Pintaric,, Ledermann & Schmalstieg (2005)	Monitor (PDA)/video	Computer vision (fiducial markers)	Touchscreen
Glass Xylophone / Kim & Kim (2004)	Simple projection/video	Computer vision (infrared)	Tangible
Interactive Storytelling/ Charles, Cavazza, Mead, Martin, Nandi & Marichal (2004)	Simple projection/video (chroma key)	Computer vision (features)	Gestures, non-tangible and natural language
Robot ARena/ Calife, Tomoyose, Spinola, Bernardes & Tori (2007)	SAR/Optical	Computer Vision (several possible features, even infrared) or ultrasound	Several possibilities, including traditional or tangible interfaces

Table 4. Indoor Games: Others

Area Independent Games

SymBall (Hakkarainen & Woodward, 2005), a mobile version of the *CamBall* (Woodward, Honkamaa, Jäppinen & Pyökkimies, 2004), and the *Mobile Goal Kick* (Paelke, Reimann & Stichling, 2004) are the main representatives

of this category. Both use the portable device camera as input, computational vision techniques, and its screen as graphical output.

SymBall simulates a game of table tennis with one or two players, using an object with a known color (preprogrammed for each game) as reference to determine its position in each instant. Thus, the cell phone itself can be used as "paddle" to strike a virtual ball, characterizing the interface as tangible.

Paelke *et al*. (2004) describe a game in which the device camera registers the position of the player's foot and inserts its image in a virtual environment seen on the screen. The foot can, with real movements, kick a virtual soccer ball towards a goal defended by a "goalkeeper", also virtual.

Given the limited computational resources of current portable devices, fewer AR games can be found using them. However, the possibility of using the very device as a piece of tangible interface (as illustrated by *SymBall*) provides interesting possibilities to be explored.

ARTOOLKIT

While tools to aid in the creation of Augmented Reality applications are not the focus of this chapter, one specific tool, *ARToolKit*, has become so popular and widely used (in a large number of the games discussed previously, for instance) that it bears mentioning.

Registration and tracking, of both objects and users, are important requirements for augmented reality applications. One of the most complex challenges in this area is to achieve this 3D registration with a certain degree of precision. One way of overcoming this challenge is through the use of computer vision techniques. Registration can also be achieved by other means, such as using magnetic or other kinds of sensors, but using computer vision brings the advantage of freeing the user from the need to wear these sensors.

ARToolkit (ARToolKit Home Page, 2006) is a software library which proposes to solve this problem in a simple and practical way. To do that, it implements computer vision techniques that are capable of calculating the positions of fiducial markers in relation to a camera in real time. Figure 1. shows a sample *ARToolkit* marker.

Figure 1. A sample *ARToolKit* fiducial marker.

ARToolKit's fiducial markers must always have a black rectangular border, but what is inside it may vary, as long as it is previously known by the software applications using it.

While it is not necessary to know the technical details of *ARToolKit* to use it, a brief explanation is interesting. First, the real world image containing the markers, captured by a video camera in real time, is simplified through thresholding, a process that transforms a color image into a black-and-white one. Then the markers are segmented, or separated from the image, based on detection of their known border. Then two steps are carried through. The first is the marker recognition from a known set of markers, based on the pattern drawn in its central part. The second step is the calculation of the geometric transformation corresponding to the marker border detected in the image. Thus, based on how the marker is deformed in the camera image, it is possible to register its position in relation to the camera.

Once the fiducial markers are recognized and have their position determined, this information can be used in several ways. *ARToolKit* has some default functionality to calibrate cameras, associate markers with 3D models of solids and then render those models over the marker, with the real world images obtained by the video camera as background. This can be done with little programming, mostly through the manipulation of configuration files, to create several simple AR applications or prototypes. More complex applications that do not use this default functionality can be created with a deeper knowledge of programming and computer graphics.

The relative simplicity of *ARToolKit* use, its availability as open source software in different platforms such as Windows, Linux, IRIX and SGI, and its low cost hardware minimum requirements (it can be used with simple webcams, for instance, which are much cheaper than other registration alternatives) are the main reasons why it has been so widely used. Even simpler to use, with its graphical interface, but for some reason not as popular, is *DART*, the *Designers Augmented Reality Toolkit* (DART, 2006). *ARToolKit* has also inspired several variations: *JARToolKit* (2006), a JAVA port of *ARToolKit;* ARTag (2006), which uses a specific set of fiducial markers that allow a more robust detection algorithm; and *ARToolKit Plus* (Handheld Augmented Reality, n.d.).

CONCLUSION

In this chapter, the intention is to briefly present the main concepts of the relatively new technology known as Augmented Reality and especially to point out the benefits and opportunities it brings to the field of human-computer interaction. Combining the virtual and real domains, both can potentially be enriched, and this combination is leading to new interaction paradigms, such as tangible interfaces, which are considerably more attractive and intuitive than the traditional ones.

For electronic games, this technology brings even more advantages. It allows, for instance, the merging of the important social aspect of board and card games or sports with the advantages of a computer for games: to make

the necessary calculations, store and apply potentially complex sets of game rules, display engaging graphics, animations and sounds etc.

In fact, the main advantage AR brings for electronic games is original gameplay. While in the past decade games have evolved considerably in fields such as computer graphics and networking, original playability has been sorely lacking lately and this is actually a great concern for game developers. Freeing gamers from keyboard, mouse and gamepad, AR makes it almost impossible not to try out original gameplay concepts, as the works discussed previously show. While some of these new concepts will probably fail and be set aside, we hope that enough remain to breathe new air into the game industry. In any case, it is clear that the game industry is not blind to their potential, as demonstrated by the EyeToy, the Wii controller and AR game engines such as A_Rage.

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PART FOUR

Beyond Design

INTRODUCTION TO PART FOUR

In the context of films, some directors and produces are referred to as auteurs, meaning that their personal creative vision is reflected in their works. During the short history of computer games, some game designers have stood out from the crowd by having their names associated with lines of games with a consistent style, quality, or both. Despite sometimes being associated with single names, computer games are results of teamwork sometimes involving hundreds of creative individuals working in a variety of roles. While some of them carry a greater creative responsibility than others, each one of them probably has a vision of how the game should play, how one's own work will affect the end result, and what kind of experience the game will deliver for its player.

Game design, in comparison to many other design practices, has only rather recently started to have well-educated potential employees and relevant academic basic research at its disposal. Regardless of the lack of academic backup in the history, supposedly partly due to a market pressure and partly to self-contained desire for innovation, the game industry has been able to come up with find new approaches to the concept of a computer game, in terms of both hardware and software. Long track-records of individual developers, combined with a degree of critical reflection and learning by trial and error have contributed to not only the games themselves, but also to the evolution of design methods unique to game development.

Computer game design research, as often practiced by designers doubling as academics and vice versa, is a topic area, on which it is possible to fuse together the views of the skilled individuals working in the industry with the critical thinking, which characterizes the academic working practices. Tacit knowledge, as defined by e.g. Polanyi (1983), exists on both sides of the border between industry and academia. The fourth and last part of this book consists of two chapters, which explore the overlap of academic research and industrial game development practices to arrive at design models of game development. Apart from being adopted alongside existing design practices, they can be used for reflecting on game development processes for analytic, productive and educational purposes alike.

In their chapter, Craig A. Lindley and Charlotte C. Sennersten present a meta-model for game design. Their model incorporates a variety of game design approaches, which, with the help of Alexander (1970), the authors have classified based on the different degrees of design self-consciousness involved. At one end of their model is implicit game design, which simply borrows from previous successes while the other end is occupied by formal reflexive game design, which is able to address fundamental questions related to the nature of computer games as a creative medium. As suggested in the chapter, the model can be used for practicing design as well as reflecting on it.

Mark Eyles and Roger Eglin situate computer game design as a multidisciplinary practice within the framework of critical realism. They observe how the designer's view of the world influences the approaches that are taken toward the problem space of game design. By drawing on critical realism ontology, information systems' design research methodologies, and practices adapted from the game industry, such as paper prototyping, the authors formulate a game design research methodology, which is further stratified into three layers; "real", "actual" and "empirical".

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Craig A. Lindley and Charlotte C. Sennersten

An Innovation-Oriented Game Design Meta-Model Integrating Industry, Research and Artistic Design Practices

INTRODUCTION

This chapter presents a meta-model describing and interrelating different approaches to and methodologies for game design. Motivations and questions behind the development of this meta-model include the need for more systematic, advanced pedagogical methods for teaching game design within specialized game education programs. A good pedagogical framework must be able to relate games to the history of other media, to be able to account for the relationships between viewing games as an industrial design activity on one hand, and as a contemporary artistic medium on the other. Games can be designed not only for entertainment or artistic purposes, but also for specific rhetorical purposes (e.g. advergaming), or to embody specific theoretical principles aimed at achieving particular affects within players (e.g. for therapy or to facilitate targeted modes of immersion). A high level view of game design needs to integrate these different design contexts and motivations. It is also necessary, specifically from a pedagogical perspective, to develop approaches to game design that facilitate the evolution of game forms beyond games that are currently available, in order to create new modes of experience, to address new markets and applications, and to deepen our cultural understanding of game form and function. A pedagogical framework for game design education must also foster creativity, leading students to be able to think 'outside the box', as well as integrating education, industrial design practice and formal research as it relates to design.

The meta-model presented in this chapter is proposed as one way of meeting these requirements. The chapter first presents a foundational distinction articulated by Alexander (1970) between *self-conscious* and *unselfconscious* design cultures. Based upon this distinction in mind, we then present the overall meta-model that integrates implicit game design methods, with what we call 'cook-book' design approaches, game design patterns and game ontologies, theory-driven design and formalist design. Each of these approaches is then described in more detail, including discussion of its relationships with the other design methods. The meta-model has been used as the foundation for an advanced game design course, and some of the resulting design concepts

are described. The purpose of the meta-model is certainly *not* to provide any kind of substitute for the creativity of designers. Rather, it is a tool for facilitating, opening up and perhaps amplifying that creativity, based upon the general principle that representations provide amplification of human cognitive capacities, as described by Harth (1999). While the model is being used to facilitate pedagogical processes that encourage more creative design by novices and to speed up the development of design competence, it also clarifies the relationships between industrial game design practice and different forms of research, contributing to ongoing discussions about the relationship between research and industrial practice in game development.

GAME DESIGN

Before going into the detailed discussion of design methodology, it is useful to present a preliminary representation of the general objects, or outcomes, of game design, as shown in Figure 1, based upon the driving concept of the game play experience, a consideration of what remains the same when a game is realized in different ways, and what design elements change in different implementations of 'the same' game. These are the various elements of form representing the final outcome of design and that shape and constitute the designed artifact. In this model, game play is at the center since this represents the core and overall goal of game design, being the design of the space of possible interactive experiences for players. This may be more or less open, from restricting the player to very limited possibilities (e.g. in a simple game like *Tic-Tac-Toe*) to very open games having a lot of scope for players themselves to shape their own experiences (e.g. live-action role-playing games, or *larps*). In all cases, the scope for players to vary their game play within the constraints of a particular game system is always at least implicitly a design decision. Of course, players may use a game system in ways that do not constitute playing within the system (e.g. a game to see who can throw a computer game CD into a hat!), but the game design itself includes, implicitly or explicitly, a scope beyond which play no longer takes place within the designed game. It is the scope of play intended by designers that drives the design process.

Driven by the target game play, the next priority in game design is the design of a logical game system and elements needed to support a space of designed play experiences. Hence the target game play provides a requirement specification driving design of the logical game system and elements. The logical game system and elements include:

- game rules that specify legal moves that players may make, the consequences of moves, win/lose criteria, etc.
- game objects are the things within the game that are referred to by the rules and may be manipulated by the player and/or game system; objects may be active or passive, and their specification can include attributes relevant to game play and referred to by the rules and game system

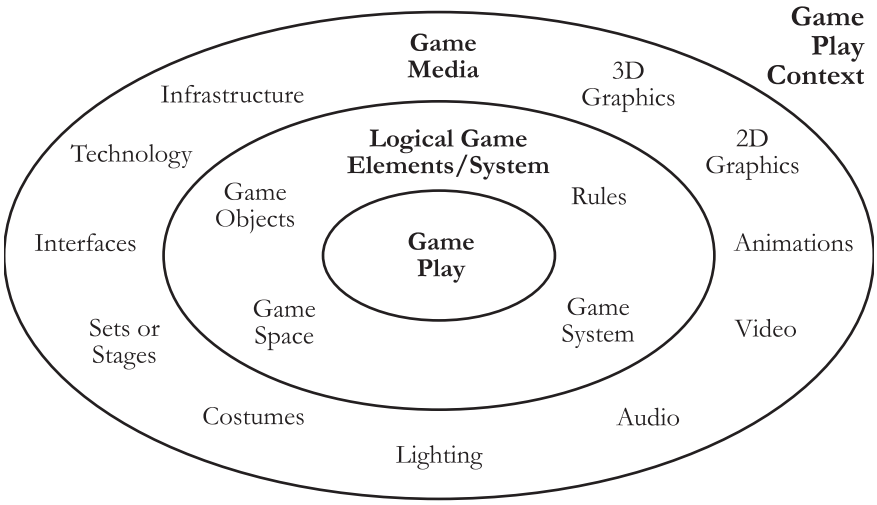

Figure 1. Elements of Designed Game Form.

- a game space, also referred to by the rules and defining a logical space within which play takes place

- the game system which specifies how all of these elements are orchestrated together to constitute a complete game; the game system includes procedures for the execution of game moves and the manipulation of game objects, according to the rules, within the logical game space, and in terms of the media used to realize a game.

The game system might include media-specific procedures, but the rest of the logical game system and elements will often be transferable across different media. For example, sports games specify particular rules, game objects (such as bats and balls), player roles and a game space (such as courts or fields); however, there are many computer versions of sports games where these elements are intact, although the system of play and the nature of the play experience are different. To the extent that the system and the play experiences differ across different media, these are examples of different games, but to the extent that the game rules, objects, player roles and game space are the same, then they are the same game: the identity of a game follows from the (variable) scope of elements taken as constituting that identity.

Once the logical game system and elements are specified, it is possible to undertake the design of the game media components. This may include 2D and 3D graphics, animations, video, audio, lighting, costumes, sets or stages, interfaces, technology and infrastructure. For computer games, costumes, sets or stages are virtual, and the game space may be organised into game levels within an overall virtual game world. For physically staged games, this will be physical elements, such as the costumes of larpers or the uniforms of sports players. Within this layer design techniques from established design fields may be applied, but always in terms of meeting the gameplay-driven requirements of the

game system. Hence established methods address the design of media elements, while game design as such is concerned with the inner core of gameplay and the design of the logical game elements and system required to facilitate gameplay.

Outside the areas of artifact design, game design also has a bearing upon the context of play. For example, a board game designed for a context such as a family home makes assumptions about what is possible within that context (e.g. a clear table around which six adults may sit); if the context does not accommodate those assumptions (e.g. no room for a larger table) then the context must be modified if the game is to be played (e.g. other furniture is moved out). Hence the game design implies or specifies requirements for features within the context of play, amounting to a degree of context design that may be satisfied either by selecting a suitable context or modifying a context to render it suitable. Contextual requirements are well understood for computer games and actively analysed by the designers of console games. Contextual factors are a significant challenge to overcome for the widespread commercialization of some new game forms, such as augmented reality games or technology enhanced games; barriers here include cost, an unprepared market, and the need for some kind of bootstrapping process by which increasing markets can drive costs down. For this reason, contextual design can have a much greater impact for new game forms having poorly established or supported context requirements.

SELF-CONSCIOUS AND UNSELFCONSCIOUS CULTURES

American architect Christopher Alexander (1970) makes a useful distinction between implicit design within an unselfconscious design culture and explicit design within a self-conscious design culture. While Alexander is specifically interested in architecture, these distinctions will be applied here to processes of game design. This may be regarded by some as a controversial application of what may be seen as a rather dated distinction. Our answers to this are firstly, that the distinction provides a useful heuristic for interrelating different approaches to game design; as a heuristic it is a simplification, but one that we have found to be effective in practice for stimulating more creative design outcomes. Alexander's distinction is a simple binary one. We have taken it further to distinguish degrees of self-consciousness in order to organize and interrelate what may be regarded as different approaches to design. This organization is just that, a way of approaching and regarding design perspectives. We do not claim that it is more or less correct than other ways of organizing and interrelating approaches to design may be, although we have not yet seen many other high level models, and we argue for the usefulness of is particular model. Secondly, in Architecture the academic discourse around design is well established and mature. In game design, it is not. It should not therefore be surprising that a metadiscussion about game design approaches should perhaps look back within the history of other design disciplines for distinctions that might be used in the early stages of a discourse that will later gain comparable sophistication.

Alexander characterizes an unselfconscious culture as one in which there is little thought about design as such and there are no general principles of

design; rather, there is a tradition of right and wrong ways of doing things and practitioners learn to imitate by practice, the same form being learned over and over again. Creation involves the repetition of patterns of tradition because those are the only ones known. There is no particular interest in new or individual ideas, and there are no written records. Concepts and the language of self-criticism are too poorly developed within an implicit design culture to make significant critical discussion possible. A novice learns by very gradual exposure to the craft, being guided by sanctions, penalties, reinforcing smiles and frowns, etc. Creation is based upon implicit (unmentioned) and specific principles of shape; unspoken rules, of high complexity, are not made explicit, but revealed through the correction of mistakes.

This mode of creation is very typical of longstanding creative practices, such as those within traditional cultures for building houses or making artifacts of different kinds. Alexander (*ibid.*) characterizes the implicit design methods of an unselfconscious culture as methods that result in highly successful forms, but only if the rate of change of the functional context of creation is comparatively slow. Designs are then adapted to slowly changing contexts by a series of very small scale changes.

In many ways, at least until very recently, the commercial game industry has shown many of the features of an unselfconscious design culture as described by Alexander. This is especially the case for games having stable feature sets, comprising standard design features within game genres such as strategy games, first-person shooters and role-playing games. Would-be designers of such games have been faced with a bottom-up model of the road to professional design that begins with hard-core gaming. The gamer might then move on to modding and scripting as an indicator of commitment and nascent design talent. The entry point for a would-be designer within a game company might then be as a tester. After demonstrating some talent for testing, it might be possible to gain a position as a level designer. The career path then goes from level design to game designer within a team to becoming a lead designer for new games. All along the way expertise is developed largely by imitation, trial, correction and experience. There is little innovation involved within design practices throughout this process and the road to becoming a fully credible design specialist may take very many years to travel.

This model of breaking into the game industry applies not only to design roles, but also the development and producing roles (e.g. see http://archive.gamespy.com/articles/january03/education/day2/). While the model may work for comparatively stable game genres, it is not suitable under conditions where design demands/functions are evolving quickly, or when higher levels of innovation are required, such as when the market is bored with established forms, when a company or publisher wants to explore uncharted territory, or to keep up with and take advantage of changing technologies. It is also unsuitable when the training of designers must be accelerated, e.g. to keep up with the demands of an expanding industry. It is therefore not surprising that, especially over the past decade, there has been an increasing development of *self-consciousness* in game design.

Alexander (*ibid.*) characterizes a self-conscious culture as one in which form-making is undertaken by explicit and general (academic) rules and principles. Education is formalised, based upon instructions and teachers who train pupils, and novices learn much more rapidly based upon general principles. Teachers engage in a general process of trying to make design rules explicit, condensing knowledge that was once laboriously acquired through experience. Self-conscious cultures arise in circumstances where new purposes occur all the time and it is not enough to copy old patterns. In this situation design education is based upon explicit general principles of function, facilitating innovations and modifications as required, although the dynamic nature of the design context means that self-conscious design tends to lead overall to less good fit.

Alexander (*ibid.*) describes how as a self-conscious design culture develops further, change for its own sake becomes acceptable. Culture changes too rapidly for adaptation to keep up with it and factors sustaining equilibrium drop away. The master craftsman takes over the process of form-making and inventiveness becomes valued as a way of distinguishing craftsmen/artists, leading to the cultural perception of the designer as a star. Specialisation underlies the establishment of design academies, and the academies make principles explicit, making them available for criticism and debate. Debate requires justification, leading to the formulation of general theories, principles and rules. Questioning leads to unrest, which leads to formal innovation and further self-consciousness.

Self-conscious design culture is concerned with both the design education of novices and explicit, self-conscious debate among established and experienced designers. One of the distinctions of experienced and expert designers (as with all forms of expertise) is an increasing *implicitness* of knowledge, with ongoing analytical processes oriented towards making that implicit knowledge more explicit. Hence explicit design knowledge accelerates and facilitates the ongoing development of expertise, but it is always very far from fully representing that expertise.

GAME DESIGN METHODS AND DEGREES OF SELF-CONSCIOUSNESS

The distinction between unselfconscious or implicit design cultures and self-conscious or explicit design cultures provides a foundation for interrelating different methods of game design. Different methodological perspectives or approaches are described in terms of their degree of self-consciousness the following subsections.

Implicit Game Design

Game design within an unselfconscious design culture proceeds primarily by copying. As Alexander (*ibid.*) notes, this really amounts to selection rather than design. Highly conservative development cultures fall largely into this mode of operation. Within this culture, a design might be developed based upon a set of known examples, where the game design document, necessary as a social record of design decisions, really amounts to a list of features selected from a range of possibilities understood from past games within the tradition

of the genre. For example, if a developer wishes to make a 'fantasy RPG', there are highly conventionalized precedents for combat, magic and trading (inventory) systems. A conventional combat system may provide precedents for character features, hit points, armor and attack values, together with rules for how these parameters are interrelated to generate outcomes from combat interactions. The fictional genres of fantasy, in literature, cinema and games, can provide predefined character archetypes, races, functions (fighter, magician, cleric, etc.) from which selections can also be made. Alternatively, new fictional elements may be introduced, such as a unique world with its own kinds of races and character classes, with the game mechanics being nevertheless selected from game genre conventions. In this case innovation is very much in the level of small scale but perhaps extensive features, such as the design of visual styles and graphics, design of specific weapons and armor, or particular novel character classes or races having different combinations or parameterizations of standard features and/or capabilities. Higher levels of innovation created by genre crossover still amount to a selection of features from established designs within genres.

The persistent popularity of genre productions makes implicit design within genre traditions a viable commercial option. The primary requirements for innovation include the need to keep up with increasing technological capacities in target machines, although the impact of this is most directly felt in the nature and requirements placed upon game media assets (animation sequences, mesh models, textures, etc.). What the implicit culture is not so good at dealing with are the rapid education of designers (it takes time to develop an extensive experience of playing and then designing games within a genre), to create new modes of experience within genres for perhaps an aging player base that is becoming restless with the same modes of play, and for creating innovations in the basic form of game mechanics for the sake of attracting new and different kinds of players.

'Cook Book' Game Design

Design 'cookbooks' are compilations of design 'recipes' consisting of rules, principles and heuristics. Cookbook approaches represent the first step in making design knowledge explicit and in making the design process self-conscious. A good example is Barwood's '400 design rules' project (Barwood, 2001; Barwood & Falstein 2002; see also http://www.theinspiracy.com/400_so_far.htm). Examples of rules from Barwood's collection include: Maintain Level of Abstraction, Make Subgames, Let the Player Turn the Game Off, Maintain Suspension of Disbelief, Differentiate Interactivity from Non-Interactivity, Make the Game Fun for the Player, not the Designer or Computer, Provide an Enticing Long Term Goal, etc. Cookbook elements are a substantial part of many game design publications (e.g. Rollings & Adams, 2003; Oxland, 2004; Salen & Zimmerman, 2004; Novak, 2005; Rouse, 2005; Bateman & Boon, 2006).

Cookbook approaches abstract from many specific examples of games to compile a superset of design features, options and principles. Cookbook de-

sign principles may be used as a foundation upon which more self-conscious approaches are founded, and many game design handbooks present more theoretical material as a context or justification of basic cookbook principles (a notable example being Salen & Zimmerman, 2004). What design cookbooks do not address in any depth are questions such as *why* certain design rules work, what it means to for them to work, what the inner motivations and rewards of game play might be, or how to design games for which there are not well understood games that can function as models to base design upon.

GAME TAXONOMIES AND ONTOLOGIES

The development of clear taxonomies and ontologies of game elements constitutes another step in rigour, clarity and comprehensiveness in the process of making game design self-conscious. A *taxonomy* can be understood as a system of named and defined classes or categories and their subclass/superclass relationships. An ontology can be understood as a taxonomy with the addition of class properties and relations between classes. In this discussion the terms tend to be used interchangeably, although in general an ontology provides a more detailed description of the conceptual structure of a domain than a taxonomy does. An ontology might be represented using i) a vocabulary of terms denoting ontological concepts, ii) definitions of those terms, that may provide criteria of their applicability, and iii) a specification of how concepts are related, imposing structure on the domain and constraining the meanings of terms.

Within the general development of game design theory, increasing self-consciousness requires the development of game ontologies for discussing the forms and elements of games and raising the structure of the conceptual domain of games into greater awareness. Numerous proposals have been made for this, including the high level taxonomy proposed by Lindley (2003, 2005) that identifies basic distinctions between simulations, games and narratives as alternate formal systems being associated with respectively increasing time scales in the design process; simulations are concerned with modeling tick by tick (or frame-by-frame) changes, games with modeling player-controlled actions at intermediate time scales, and narratives being concerned with the largest scales of time structure. Lindley (2003) further distinguishes the orthogonal classification dimensions of fact/fiction representational functions and physical/virtual staging strategies for games. Aarseth *et al*. (2003) propose a taxonomy based upon a variety of formal (i.e. non-narrative and non-representational) characteristics covering space (perspective, topography, environment), time (pace, representation, teleology), player structure, control (mutability, savability, determinism), and rules (topological, time-based, objective-based). Klabbers (2003) presents a taxonomy of game *pragmatics*, i.e. a taxonomy of the external functional application domains of games, game form and simulation, including business, administration, education, environment, health care, human services, international relations, military, religion, technology, human settlements and imaginary worlds. Foci of interest (including theory and methodology, instrumental design, research, training and

education, and entertainment) are then broken down in a different dimension and themes (including competence, communication, knowledge/skills, management/organization, policy and fun) in another.

Björk and Holopainen (2005) present a taxonomy of the high level aspects of games, presented as a game component framework that includes: Holistic Components dealing with aspects of the game regarded as a whole (game instances, game sessions, and play sessions), Structural Components that are the basic parts of the game manipulated by the players and the system (including an interface, game elements, players, a game facilitator and game time), Boundary Components that limit the activities of a player of a game either by only allowing certain actions or by making some actions more rewarding than others (including rules, modes of play, goals and subgoals), and Temporal Components that describe the time flow of a game (including actions, events, closures and subclosures, end conditions and evaluation functions).

The classic work of Caillois (1958) presents a taxonomy of forms of play based upon an analysis of Latin terminology, including *agon*, based upon competition, *alea*, based upon chance, *mimicry*, based upon simulation and the kind of play associated with acting a role in a theatre production, and *ilinx*, based upon vertigo, "an attempt to momentarily destroy the stability of perception and inflict a kind of voluptuous panic upon an otherwise lucid mind". Caillois (1958) also discusses the distinction between *paidia* as uncontrolled, free, improvised and ecstatic play, and *ludus*, which is play tightly bound up with arbitrary, mandatory and often tedious rules and conventions. Between paidia and ludus there is a continuum between which there are degrees of variation, from total freedom to heavy but arbitrary constraint.

Game design patterns are another form of game ontology. The concept of game design patterns has been developed by Kreimeier (2002), Björk and Holopainen (2005) and Kirk (2005). Björk and Holopainen (2005) define game design patterns as "semiformal interdependent descriptions of commonly reoccurring parts of the design of a game that concern gameplay". Game design patterns are essentially higher-level structures of game elements that might be described by component-oriented taxonomies, together with interaction patterns. Björk and Holopainen (*ibid.*) present 200 game design patterns, including the familiar patterns of Paper-Rock-Scissors, Save-Load Cycles, Enemies, Game World and Combat. The balance between interaction structure and other contents of game design patterns, as they have been articulated to date, varies. It is an issue of ongoing concern to validate the usefulness of the existing patterns within different contexts, and to further refine them or specify new patterns for purposes for which the currently identified patterns are not adequate.

Game taxonomies and ontologies are useful for *describing* game elements and design concepts in a way that is more systematic and comprehensive that cookbook compilations of design knowledge, also addressing structural features missing from cookbook approaches. However, they are not in themselves adequate for *explaining*, *justifying* or *motivating* design decisions. The next level in design self-consciousness must address these issues of why specific design choices are made. This requires the development of empirically validated

theoretical perspectives by which game designs expressed according to suitable taxonomies and ontologies can be interpreted and/or motivated.

THEORY-DRIVEN GAME DESIGN

Theory-driven design refers to the next stage in the explicit and self-conscious development of designs in which design elements, principles and/or patterns are selected according to clear and conscious criteria. Those criteria are regarded as constituting or deriving from some form of motivational or interpretative theory. Relevant theories may include *rhetorical theories* of how a design can achieve changes in the beliefs, behaviors, consciousness or ways of perceiving of players, *scientific theories* about player motivations, the function of games and affects of play upon players, and *general theories*, which may be theories about any aspect of the form, structure, history, purpose or meaning of the world or things within the world.

Rhetorical Game Design

Rhetorical theories amount to theories about how a design can produce specific attitudinal, epistemic, behavioral or perceptual changes in players. Games designed from a rhetorical perspective include so-called 'serious games' (e.g. see http://www.seriousgames.org/) or *third-party games*, i.e. games designed to achieve purposes for some agency other than the players and the developers. Third party games include games that function as advertising, political games, social games, educational games and ideological games. There are many examples of rhetorical games. *America's Army* (2002) is essentially an advergame commissioned by the US defence department and designed to convince players to join the US army. *Howard Dean for Iowa* (2004) is a political game supporting Howard Dean's US presidential bid. *Foreign Ground* (2005) is an educational game designed for training defense personnel on peacekeeping missions. Many games have been developed for health education (http://www.gamesforhealth.org/) and for making various kinds of political points or statements (see, for example, http://www.watercoolergames.org/archives/cat_political_games.shtml).

Although many rhetorical games have been developed, the theory behind the rhetorical function of games is not yet very advanced. A deeper understanding of the rhetorical functions of games and game play requires deeper and more scientific or empirical study of game functions and player affects.

Scientific Game Design

Scientific theories may address many aspects and levels of game function and affects. This category is distinguished from the previous category of rhetorically motivated design in the adoption of scientific methodology in understanding game affects. Of course, rhetorical game designs could also base their design principles upon scientifically studied design effects, in which case rhetorical design and scientifically motivated design are the same thing. A number of

studies of game play have investigated emotive issues such as game addiction (Fischer, 1994; Griffiths & Hunt, 1998; Salguero & Morán, 2002) and correlations between computer game play and violent behavior (Ballard & Weist, 1996; Griffiths, 1999; Anderson, 2004; Smith, Lachlan & Tamborini, 2003). In order to more fully understand how game play can change players, and to support much more specifically targeted game design in terms of player affect, more detailed, fine-grained studies of psychophysiological and neurological responses to game play are required (e.g. Ravaja *et al.*, 2005; Mathiak & Weber, 2005). The high level context for scientific studies might be regarded as the question of how player characteristics (personality, aptitudes, motivations) together with specific design features and play circumstances result in measurable and identifiable psychological and physiological changes during and perhaps following game play, where those changes might vary from very temporary changes to permanent changes. Cognitive, psychophysiological and neurological studies of game play hold the potential to reveal the details of cognitive and emotional processing that lay behind player engagement and immersion in game play, and unravel the uninformative concept of 'fun' into much more specific factors of motivation, attention and cognitive task performance in relation to different patterns and characteristics of game design features.

Scientific theories of game engagement and affect can provide deeper foundations for designing the rhetorical functions of games. They can also allow games to be designed for various other targeted effects. For example, games have been found to function effectively in therapeutical applications, such as the treatment of phobias (Robillard *et al.*, 2003). A deep understanding of the effects of game play upon players holds the potential for the design of games that achieve particular effects of *cognitive reprogramming*. Of course, there are ethical considerations in this. However, implicit design or design with limited self-consciousness holds the danger of achieving these kinds of effects in a completely unconscious way on the part of designers and players. Articulating a well-developed science of gaming moves game play effects into the foreground of consciousness for explicit critical analysis of game functions. This certainly does not mean that scientific theories of game design should only be used for third party or rhetorical functions, since those theories can also support more informed design of the principles and affects of entertainment products.

Time Frames of Scientific and Technical Research

A notable aspect of scientific research is that it can also be regarded in terms of levels of innovation, as depicted in Figure 2 (focused upon industrial and technical research in the case of the bottom two levels), analogous to the levels of self-consciousness involved in design innovation. Within this model:

> *Basic research*, or blue-sky research, is the pursuit of new knowledge without any assumptions about what it might lead to. This is knowledge for its own sake. In general (but not always) basic research can be expected to have a long time frame to the development of clear results, e.g. 10+ years, with even longer times being

required to generate practical applications founded upon these results. Research into the molecular foundations of neural processes falls into this category.

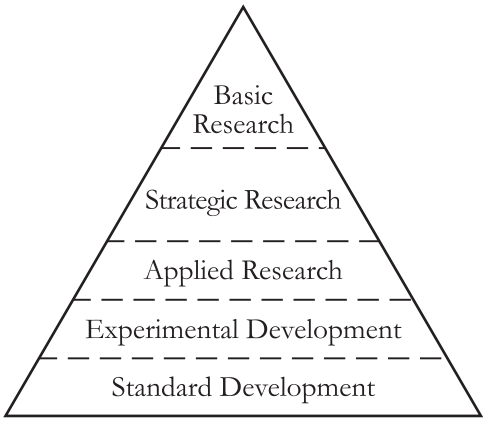

Figure 2. Levels of Scientific Research and Development Innovation.

Strategic research is the pursuit of new knowledge that might in principle have practical applications but without a precise view of the time scale or nature of the application. Strategic research will generally have a mid- to long-term time frame to the development of clear results or practical applications, e.g. 5 to 10 years. A project developing non-invasive methods for detecting brain states might fall into this category.

Applied research is knowledge developed with a specific objective in mind, particularly the conversion of existing knowledge into products, processes and technologies. Applied research will generally have a mid-term time frame to the development of practical applications, eg. 2 to 5 years. A project aiming to create a prototype system that detects player-controllable brain waves and feeds them into a game engine as an interface device might fall into this category (e.g. http://www.heroicsalmonleap.net/mle/mindbalance/index.html).

Experimental development is work undertaken for the purpose of achieving technological advancement for the purpose of creating new, or improving existing, materials, devices, products or processes, including incremental improvements to these (http://www.ccra-adrc.gc.ca/taxcredit/sred/publications/recognizing-e.html). Experimental development projects are relatively short, typically being completed within one or two years or less. An example of this would be a project to develop a console controller interface to a skull cap containing electrodes as a product to integrate mind control with video game play.

Standard development is development by selection of standard solutions to well understood problems, requiring little to no innovation. This is the level not only of traditional crafts, but also of routine industrial production. Standard commercial game development falls within this category.

Within this model of forms of research, long term, basic research asks more fundamental questions, involves more risk and has potentially very high payoff, in some cases generating results that totally transform the basic assumptions of a scientific field. At the other extreme, standard industrial production operates at a level of highly standardized practice, involves little to no innovation, and incurs minimum risk. Applying this model to game research shows that potentially long time scales may be involved (e.g. ten years or more) before more significant research results are generated and fed into industrial game design practice.

Scientific theories can be understood to include technological research, such as research within computing and communications technologies. In this case technological innovations may support new modes of game play. Examples here are numerous, including games based upon mixed and augmented reality technologies (eg. Szalavári *et al.*, 1998; Björk *et al.*, 2001; Piekarski & Thomas, 2002; Magerkuth *et al.*, 2003; Magerkuth *et al.*, 2004), and games based upon modified game play due to the development of artificial intelligence methods for more effective characterization, dramatic interaction and emergent story construction (e.g. Cavazza & Charles, 2005; Mateas & Stern, 2002).

Game Research in Relation to Autonomous Research Disciplines

In considering the relationship of research to game design, distinctions may be made between research specifically directed at understanding game form, research within autonomous disciplines that is directed at games as an application area, and research within autonomous disciplines that is not specifically concerned with games, as depicted on Figure 3.

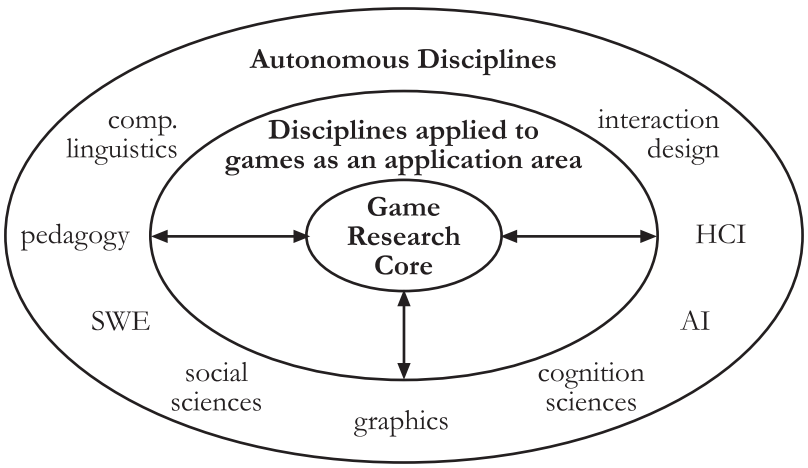

Figure 3. Disciplinary structure of game research.

Autonomous disciplines, such as the examples used in Figure 3 including human-computer interaction (HCI), artificial intelligence (AI), cultural studies, cognitive science, computer graphics, pedagogy and software engineering,

have subcultures and processes that have no intrinsic dependency upon or interest in games. However, research within these disciplines may turn to games as an application area or object of study. In this case the specific methodologies and knowledge of those fields is applied to various questions arising from gaming and game design and development. Core game research, however, is concerned with game form as its first priority. These different areas interact. Core game research may derive models and principles from applied research from other disciplines, while those applied disciplines benefit from the deeper analysis of game form undertaken by core game research. Hence the input from research into game design may be highly indirect, generating results firstly within autonomous discipline areas that are then fed into research applied to games, which then feeds into the central analysis and articulation of game form. Also, autonomous research does *not* need to feed into industrial game design and development via core game research, but may flow directly into industrial game development. In fact, all computer games are based upon research in this way, using research results that provided the foundations for the technologies and communications infrastructure with which computer games are implemented. At the time of writing, core game research is too young as an academic field to have had time to have much impact upon industrial game development, although this is likely to change as the field matures.

General Theories Motivating Game Design

General theories represent interpretation paradigms, or sets of basic assumptions about aspects of the world from which many other understandings may follow. An explanation that maps a phenomenon back to one or more of the basic assumptions or their implications within an interpretation paradigm constitutes an explanation within that paradigm. For example, identification of a player with a player character while playing a first-person shooter might be interpreted within a Freudian interpretation paradigm as the expression of unresolved Oedipal conflicts in which enemy monsters represent threatening aspects of the player's (primal, symbolic understanding of their) father; then the Freudian-inspired designer might seek a game design that substitutes simplistic victory over the game boss with a more subtle process of identification with the father figure and transformation to a post-Oedipal psychodynamic motivation. Of course, the same phenomena can be explained by different interpretation paradigms in totally different ways, mapping them back to completely different foundational ideas. The interesting outcome may not be the theoretical justification in itself (which could be quite idiosyncratic), but the novel game concepts that result from it.

FORMAL REFLEXIVE GAME DESIGN

Formal reflexive design focusses upon fundamental questions about the form of a creative medium; it is concerned with the production of artefacts that are about the medium within which they are produced, including conventions of production and interpretation for the medium in question. This approach has

been a significant facet of modernist investigations of different media. Modernism has been a prominent cultural movement, particularly in the twentieth century, representing a radical change in the way different creative fields approach their work. This change has occurred within all established art forms and media, including painting and visual art, sculpture, literature, poetry, music, theatre, cinema, dance, and architecture. When cultural movements go through revolutions, genres tend to be attacked and mixed up, new genres are generated and old ones fade. These changes are often reactions against the prior cultural form, which typically has grown stale and repetitive. While the history of modernism is very complex, here it is possible to refer to a number of strong tendencies relevant to the game design meta-model:

- maximisation of self-consciousness and reflexivity in relation to a particular medium.

- questioning all aspects of the form and content of a medium.

- there is a movement away from representation, and away from or to disrupt conventional codes of representation.

- there is a strong focus upon pure form itself (e.g. line, colour, texture, material of the medium), frequently with a concern with the emotional, conscious and/or affective states induced by form (rather than by any denoted object). In the case of games this means a focus upon the essential nature of a game, and the relationships between the core game system and the media used to realise a game.

- a lot of modernist work has sought to answer the fundamental structuralist question: what is the medium? Since games have a tendency to be trans-medial (i.e. a particular game may be able to be realised using quite different media, e.g. as a board game, as a computer game, or as a game staged by people), the reflexive questions may be asked as to whether games can really be considered to be a medium, what may be gained or lost by considering them to be a medium, and if they are not a medium, then what are they?

Modernist work that disrupts conventions and expectations functions to make those conventions and expectations, and their consequences as media functions, become explicit rather than implicit. In a sense this amounts to the deliberate production by modernist artists of what might be seen as 'misfit variables' in Alexander's (1970) terms in relation to the preceding media culture and how it expects art (or a medium) to function. Just as design misfits make design features visible, disrupted expectations make media form and function visible. Modernist works therefore function as explicit statements of abstracted media form and affect.

This chapter will not dwell in any detail upon the vast and complex field of modernism. However, formal reflexive ideas of a kind that have been strongly demonstrated within modernism are here regarded as informing a large-scale cultural project of maximizing self-consciousness within various media. One key issue here, however, is that, as Small (1994) points out in the case of avante

garde cinema, the high levels of self-consciousness and reflexivity involved in much formally reflexive practice do not rely upon textual or verbal representations. Rather, a great deal of work is self-consciously articulated within the tradition of its medium, in a form referred to by Small (1994) as *direct theory*. Writing may surround, refer to, critique and analyse works in other (than literary) media, but those 'other' media also have an autonomous discourse. This is the whole point of reflexive design, to create work that reflects upon its own form.

These considerations apply within all media. It may also be observed that formal reflexive or programs within a medium tend to 'burn out' or become exhausted after a period of intensive investigation. Avant garde artworks thereby function to map out a space of design possibilities from which ongoing work may draw without in itself being avant garde. In other words, avant gardes define a self-conscious design space in terms of which ongoing design may locate and define itself. Further innovations within these ('modernistically') exhausted media may proceed via *postmodern* strategies, often involving hybrid media forms, reiteration of past styles and forms, new combinations of formal elements, and self-conscious production of pre-modern or naïve forms in the form of self-conscious kitsch. This tends to occur together with a devaluation of the academised values of modernism and formal reflexiveness (which may be regarded as being 'too sterile'), and the distinctions between 'high' culture, popular culture and commercial culture break down. Meanwhile, if new media are developed, the modernist impulse becomes relevant again in application to those media, to push their limits and expose their form, meaning and functions.

Applying the formal reflexive perspective to game design asks fundamental questions about the nature of games and play, leading to experiments intended to stress our understanding of and assumptions about games and play. Examples of games manifesting this perspective include the genres of alternate reality games (see http://www.argn.com/) and larps played in games spaces where people may be interacting with gamers in a game but without any consciousness that they are part of the game. These examples raise questions about whether unwitting participants are players or not, and even of whether the game is a game or not, when it has extra-game consequences for (possibly unknowing) participants.

Formally reflexive game design constitutes a kind of avant garde game design practice having philosophical and operational similarities to other avande garde practices in the history of the arts. This does not mean that formalist work exhausts the possibilities of dealing with games from a contemporary artistic perspective. For example, artistic projects concerned with games may also be driven by theoretical considerations, or focus upon various rhetorical possibilities of game form. However, it is formally reflexive game design concepts that have the greatest self-consciousness about the fundamental nature of games and play.

AN INTEGRATED META-MODEL

The design approaches described above represent an increasing level of explicitness and self-consciousness about game design, leading to the integrated

design meta-model illustrated in Figure 4. The triangle form is used to suggest the metaphor of a pyramid, with higher levels being at least conceptually built upon lower levels, and involving a hierarchy of increasing abstraction and conceptual essentialism.

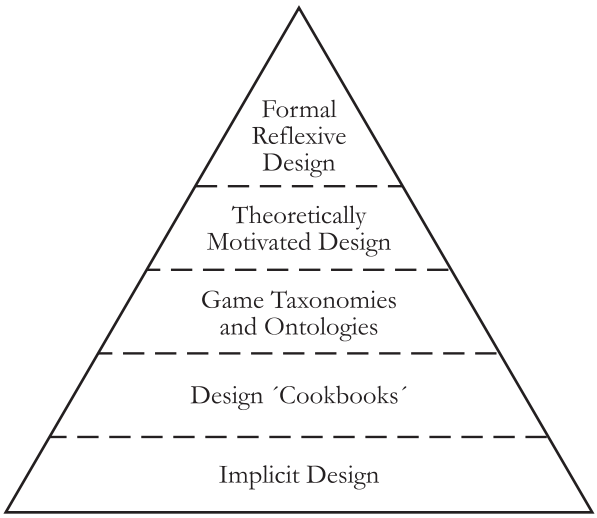

Figure 4. Game Design Meta-Model.

Moving from the base to the apex of the pyramid shown on Figure 4 represents the following tendencies:

- as already emphasized in this chapter, an increase from implicit, unselfconscious design to more and more explicit and self-conscious design.

- a movement from a focus on the small scale details of a design to higher level abstract properties of a design.

- a movement of awareness from an intuitive understanding of form based upon an (extensional) understanding of very many examples to a more reflective (i.e. intensional, explicit and conceptual) approach to design and understanding of design features, based upon the extraction of a comparatively smaller number of generalizations from a large number of examples.

- a development away from design knowledge as peripheral background knowledge towards design knowledge as focused foreground knowledge.

- a shift of concern from the *representational* functions of a design toward basic game form. The representational functions of a design concern the (fictional) world of a game, typically following from a fictional genre (science fiction, fantasy, etc.). Basic game form concerns game mechanics and modes of interaction. The details of a represented game world can be modified extensively with no change to the underlying basic form, and vice versa.

- a decreasing stability of function of the design and increasing role of design *per se*. For example, modes of game play may be based upon well established models (e.g. 'a role-playing game', RPG, or 'a first-person shooter', FPS) at the bottom of the pyramid, while at higher levels completely new gameplay modes having unknown value for and effects upon players may be introduced. Commercialisation of unstable design forms may require consolidation of their functions into specific variants that can be communicated to markets and associated with market preferences.

The pyramid from the base to the apex also represents an increasing scope of novelty and innovation. At the implicit and cookbook levels novelty tends to be limited to representational content and small-scale details of formal design. Representational innovation refers to the development of new and novel types and instances of game stories, scenarios, characters and game objects, especially as conveyed by graphics and sound design. Small scale details in the game form itself might include elements such as parameter ranges for the features of game characters (e.g. attribute statistics, like strength, intelligence and dexterity), inventory items (values, damage points), etc.. At the level of design patterns, novelty may be achieved by new combinations of patterns being realized together within a specific game. At the level of theoretically motivated design, theoretical motivations may lead to, facilitate or require novel game mechanics, or mechanics designed to frustrate player expectations in order to make a specific point or to serve particular rhetorical aims. At the formal reflexive design level novelty may occur in the most fundamental aspects of a game design, leading to totally new kinds of games and play experiences, or even to questioning and redefinition of the players' understanding of the very nature of a game.

RESULTS OF APPLYING THE DESIGN META-MODEL

The design meta-model presented here has been applied in a game design education context. The model was initially devised to address the concerns listed in the introduction, and particularly with a view to structuring design activities aimed at achieving higher than usual levels of innovation. 'Higher than usual' here refers to a history of design workshops within undergraduate game development programs and other professional and semi-professional design workshop contexts.

Statistical empirical testing of this kind of meta-model is impractical in the short term, the best global measure of its usefulness being the degree to which it may be referred to and/or used over time by professional game designers or game design educators. In terms of our immediate experiences in applying the model within undergraduate game design education programs, the following anecdotal evaluation information is offered:

- the meta-model has been used as the foundation for an advanced game design course in which students study the various levels of the proposed hierarchy. Within the course, games are brainstormed and developed to a playable stage and evaluated in a sequence

corresponding to a movement up through the hierarchy, beginning in this course with the design patterns and taxonomies level, moving through theory-driven designs and ending with formally reflexive game design.

- the meta-model appears to be understandable to students (although not all levels are initially obvious). Students in the third year of a game development education program expressed the view that they really would have benefited from having this framework presented to them much earlier in their studies, since it provides a framework and language for talking about game design that they had lacked and would have greatly benefited from.

- the higher levels of the design pyramid represent areas that could be developed in endless ongoing detail. The framework therefore appears to represent a very convenient conceptual model for integrating ongoing research and development activities in game design, game aesthetics and related fields. Within the environment of the authors, the framework is very appealing as a high level map clearly interrelating the content of undergraduate game education programs and higher-level game research activities.

- the design workshops at the game pattern, theory-driven and modernist levels have resulted in examples of games having relatively high levels of interest and novelty compared with the typical results from game concept workshops in our experience. One simple example is the formally reflexive computer game *Sumo* (2005/2006), designed by Kajfa Tam. *Sumo* is a two-player game in which each player must place their fingers on specific keys on the keyboard. They must then try to use their respective hands to push their opponent's hand so that at least one finger is pushed off its assigned key, without stopping pushing down on their own assigned keys. The first person to take a finger off a key is the loser. *Sumo* is a very simple game that nevertheless completely violates our normal expectations about computer game play and interaction.

- in many cases the initial reaction of students to the design assignments based upon the meta-model has been trepidation if not outright fear of entering design spaces having few if any exemplified precedents. Despite this, most of the resulting designs are successful in achieving fresh results and often highly entertaining game play.

The meta-model has also been very useful in clarifying our own thinking about design processes and methods, their interrelationships and the role of different kinds of research.

CONCLUSION

The game design meta-model presented in this chapter is a principled heuristic framework interrelating a variety of design approaches, including implicit design (by copy), cookbook design methods, taxonomy and ontology-based game design, theory-driven design and formal reflexive design. The theory-driven level inspires new game and play concepts based upon technical, scientific and theoretical innovations, while the formal reflexive level represents the application of contemporary artistic perspectives to games. The meta-model

provides a clear account of the nature and place of research both for motivating design decisions and for game design innovation, and provides a foundation that can be used for game education curriculum development integrated with higher-level research. We do not claim that the model is absolute; for instance, the boundaries between levels could be drawn differently; they represent tendencies rather than precisely definable distinctions. However, our experience indicates that the meta-model is effective in opening up new ways of thinking about, talking about and practicing game design, leading to fresh and innovative gameplay concepts.

ACKNOWLEDGEMENTS

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Mark Eyles & Roger Eglin

Outlining a Stratified Game Design Research Methodology

INTRODUCTION

In this chapter game play mechanisms are set in the context of full games, which are in turn set in a wider context of simulated future technologies. Additionally this methodology is viewed and informed through a critical realist lens to give an example of an ontological perspective, and a foundation, not only for the way the games operate, but also for the proposed design research methodology. Prototyping processes that mimic components of the development process within the games industry are described and by considering all the differently layered components of research, games and emergent phenomena a holistic approach to game design research is proposed.

One of the authors of this chapter spent over twenty years working as a designer in the computer game industry before moving into academic research and teaching. The other author has wide research experience, including research for the games industry, and lectures on research for the creative technologies. The methodology described here has evolved through both reflection on game design in the computer games industry, the game development process and through a search for an example of a philosophical basis for viewing game design research. As with design in information systems projects designing useful artifacts (such as games) is complex due to the need for creative advances in domain areas in which existing theory is often insufficient or non-existent (Hevner, 2004). This chapter describes the way a number of different threads can be merged to form a methodology that not only offers a flexible way of interrogating game play mechanisms and computer game design, but also allows researchers to investigate future game technologies. The types of game discussed in this chapter are computer games, though it may be that this methodology could be adapted for other types of game such as board or collectable card games. Video-games (console, handheld, set-top box and so on) are considered to be types of computer game. Although they include non-computer game components this methodology should also work for pervasive games, such as alternate reality games (often also known as cross-media games) and locative game types, such as augmented reality games.

EXPERIENCING GAMES

This section considers the fundamental structure of computer game playing. This is not about different game genres and game play mechanisms but rather is about what it is to play a game, how this relates to a proposed underlying structure of reality and human experience. An explicit description is given of how a view of fundamental strata of reality may be echoed in the process of playing games.

When playing computer games auditory, visual and other information from the games are received by the senses (sight, hearing and so on). The physical existence of computer games consists of flows of electrons through electronic circuits, the glowing of phosphors or liquid crystals on screens and the electromechanical movements of speakers. Importantly games also comprise the inputs from players via controllers of some kind (joypad, keyboard, mouse, joystick, camera and so on). Each input derived from the result of a decision by the player. The decision-making occurs in the minds of the players, based on prior knowledge and the information they have received via their senses. They use this knowledge and information to create a model of the computer game in their minds. The physical processes in the brain are part of this system, though whether these are wholly responsible for the mind is still open to debate. The mind of the player may be a consequence of (currently partially undiscovered) mechanical processes (materialistic monism) or may be wholly separate from the physical world (described as dualism by René Descartes). Predicting the properties of the mind that emerges from the physical structures of the brain is not currently possible. Perhaps the differentiation between the physical brain and mind will be explained eventually by quantum mechanics (quantum brain dynamics (Globus, 2004)), resulting in an understanding of processes and structures that remove the need to differentiate between brain and mind. Consciousness becomes something understood in a "quantum theoretical framework" (Hagan, Hameroff & Tuszyäski, 2002) or perhaps, more precisely, quantum computation in cytoskeletal microtubules (Hagan *et al.*, 2002) and (Hameroff, 2006). However a detailed discussion of this is beyond the scope of this chapter, suffice that the mind emerges from, or in, the brain and may be a result of quantum events.

In academic research, and commercial game companies, design of games is often based on 'kernels of knowledge' derived from experience and experimentation. These kernel themes may be extended by means of induction and abduction by the researcher or designer (Walls *et al.*, 1992; Markus *et al.*, 2002 cited in (Hevner, 2004)). This is analogous to empirical studies which are frequently used by researchers to generate results that can be robustly defended. The use of empirical studies is fine, but should not be at the exclusion of all else. Focussing solely on empirical studies is the methodological doctrine of empiricism, which is a great way to create empirical generalisations, but useless at creating explanatory theories. A discipline is only elevated to the status of a science when it is underpinned by theory. This chapter next discusses the theoretical underpinning of game design research, drawing on critical realism as an example of a vehicle to link ontology and game design.

When discussing anything in the world we are taking a view of the world. Any knowledge that we have is dependent on this view of the world and we cannot discuss anything without having a view of the world, whether we choose to acknowledge it or not. This understanding of a view of the world is also known as 'ontology', the nature of what is. A solid foundation for the creation of new knowledge can be laid by making our view of the world clear.

Epistemology is the nature of what can be known. If we talk together I can make sense of what you say, but also accept that you have sense and intelligibility that is separate and independent from mine (we each have our own view of the world). We might further accept that there is an independent and separately existing reality. There are viewpoints that do not require this independent reality, but the stance we are suggesting does not encompass these. The different understanding that people have of events, even if they agree there is an independent reality, makes it clear that an understanding of context is necessary when considering the relevance and authenticity of any information. For example the statement 'I think you are really clever' could be delivered as genuine praise or as a sarcastic comment, with completely the opposite meaning.

To further develop the way in which a particular understanding of the world, or ontology, can inform research methodology and hence the methods used we will next use as an example a view of the world known as critical realism. Founded by Roy Bhaskar, critical realism may be described as a philosophical or ontological view of the world. At its heart critical realism is a stratified view of the world in which layers of 'real' mechanisms, 'actual' events and 'empirical' experiences each sit one upon the other. Roy Bhaskar (1978) states that the world may be viewed as comprising of structures and mechanisms that combine to create a flux of phenomena that are 'happenings of the world' or events. These events, when manifest, may be identified by people. For example atoms combine to form molecules whose properties we can observe and measure. However, studying properties of atoms does not allow us to predict the properties of molecules; an understanding of the properties of hydrogen and oxygen does not enable the observer to deduce the properties of water (Sayer, 2000).

The world consists of 'things', which are complex objects with 'tendencies, liabilities and powers' or properties. These properties may be used to explain the phenomena of the world. New phenomena, entities, structures and so on are generated from existing material, however this generation is emergent and it is not possible to deduce or induce them by looking at the properties of this pre-existing material.

As mentioned previously reality may be described as three overlapping domains: the real, actual and empirical, which correspond to mechanisms that generate *events* that are perceived as *experiences*. In this way the monist and dualistic views of the world are superseded by a view in which the observer may be part of the world. The brain, including quantum structures, belongs to the 'real' which has mechanisms that generate quantum and other electrochemical 'actual' events that are perceived as 'empirical' experiences (and consciousness).

However, people may imagine experiencing events that allow them to induce, or deduce, mechanisms, which may be either imaginary (i.e. not real) or real. Ascertaining which mechanisms are imagined and which are known to

be real requires empirical study, which gives rise to epistemic questions about the nature of knowledge and how this determines our fundamental understanding of the universe we live in.

The experience of different people of the same object in time and space can vary, for example Kepler watching the rim of the earth drop away while Tycho Brahe watches the sun rise (Bhaskar, 1998). Events are independent of experiences and the world may contain events both unperceived and unperceivable.

Overlapping domains of reality		
Real	Actual	Empirical
Mechanisms	Events	Experiences
Brain structures	Quantum and electrochemical events	Consciousness
Strata of computer games		
Game rules	Game interface and events	Player engagement/presence
Digital code and art assets…	Screen, controller…	Decision making, aesthetic appreciation…

Table 1. An example of overlapping domains of reality if viewed from critical realism

In the approach adopted this stratified view has each layer building on the previous (Walliman, 2001). Table 1 shows the strata applied to both the world, the brain and computer games where sets of instructions (program code) create sensory information (visual, auditory and even tactile) containing cues that are then interpreted by players to create rich and complex worlds in their minds. This is evident, for example, in text adventures, where only limited information on the worlds is provided, yet players are sufficiently involved to play for many hours as they move through imagined worlds. In games with little or no story, such as simple puzzle games like Tetris (1986) a set of rules is converted into graphics that engage the player in a competition with themselves as they make many decisions a second. The player does not create the same sort of 'rich and complex world' they create when playing an adventure, but does become immersed in their own fast paced endeavour as they compete with the tokens on screen and try to better their own highest score. The player's immersion can be highly emotive and satisfying and may be similar to the flow state described by Mihaly Csikszentmihalyi. In a flow state the player has an 'optimal experience' typified by a high degree of focus and enjoyment (Salen & Zimmerman, 2004). These behavioural elements must be taken into account when evaluating games in combination with software engineering aspects of the game, see Figure 1.

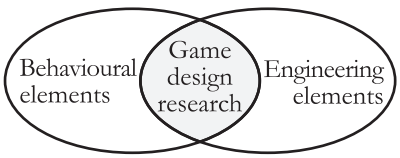

Figure 1. Combination of behavioural and engineering aspects to give game design research

Consequently computer games combine the worlds of rules, mechanisms and experiences. A set of underlying game rules are used to create observable, emergent game play mechanisms exhibited in the computer, or console, and in the responses and game inputs of the player. For example, imagine a platform game with a character standing on a platform facing across a gap to a second platform. The game rules determine that the character can jump a certain distance, will not fall through platforms and is affected by gravity and so on. These rules are not in and of themselves fun, however when they are combined you have a 'jump the gap' game play mechanism, which may be found in a platform game.

Computer games further have an experiential component (such as the flow state) that exists in the mind of the player and which is not directly observable by a researcher. In order to study these emergent events it may be useful to isolate (or focus on) single game play mechanisms, in order to decrease the complexity to manageable levels. A full game may be simulated to do this, but the mechanism at the centre of the research is given greater emphasis. For example if a researcher was investigating 'jump the gap' mechanisms in platform games they could create a simple, playable platform game in which the levels consisted entirely of platforms with different sized gaps; there would be no ladders, pick ups, power ups, enemies, title screens and so on.

Computer games containing stories (role-playing games, for example) present the player with an incomplete model of a fabulated world. The player may then willingly suspend their disbelief and spend time inhabiting this virtual space. To study this requires moving beyond observed events, and we can draw upon a critical realist structured approach with its 'structured' or 'stratified' reality (Grix, 2004). The ability to approach the subject on a number of different levels and the acknowledgement that reality contains components that are perceptually constructed is essential.

Figure 2 shows the relationship of a researcher to a game player and a computer game within the wider context of 'all reality'. In this figure the body has been firmly rooted in the physical world whereas, for convenience, minds are in their own stratum. As discussed earlier the brain contains its own mechanisms, events and experiences, but to try to add this would make the diagram unnecessarily complex ending up with an infinitely regressing loop of reflection (mind thinking about watching mind thinking about mind watching mind thinking about...). The three strata, previously described, of the real (mechanisms), actual (events) and empirical (experiences) are shown on this diagram.

At the left of the figure is a console (or computer) which is running the game. At the centre of the game is a player controlled avatar, the player's representative in the game world. Around the avatar is a layer labelled 'avatar interface', which interfaces directly with a layer labelled 'gameplay mechanisms'. These two layers are how the avatar interacts with the game world. For example the avatar may have the ability to pick up items in the game world; to achieve this the avatar needs a 'pick up' component as part of its interface and the game world needs to have a game play mechanism that assigns the attribute 'pick up' to objects in the game world.

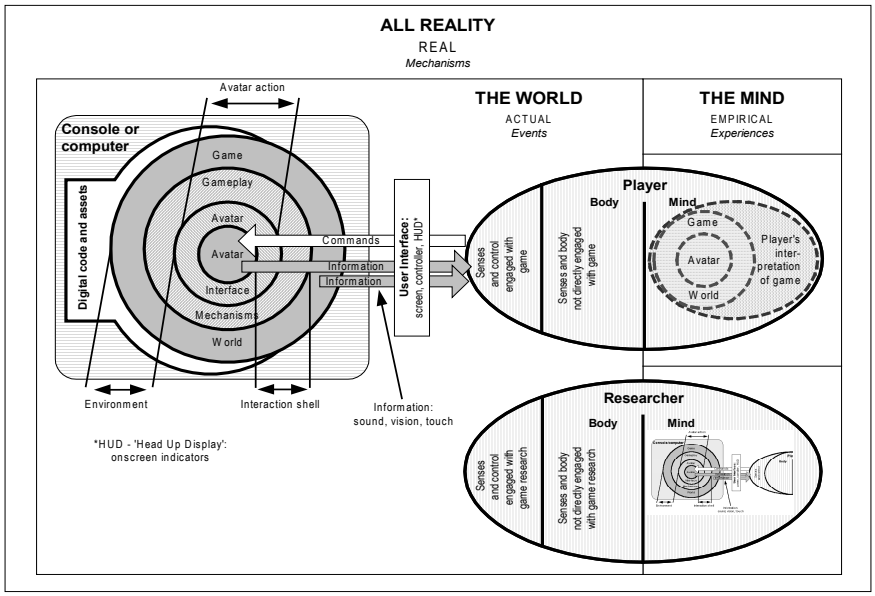

Figure 2. An example of an ontological position for games research viewed from critical realism

The player and researcher to the right of the figure each consist of a physical body and a mind. The player is thinking about the game and has a model of the game world and avatar in their mind (not necessarily identical to the actual game, but their interpretation). The researcher is thinking about the game and the player. Note that the researcher has knowledge of the player's physical body, but does not have direct knowledge of the mind of the player. Though the researcher may build a model of what they think the player's mind is like this is not shown due in order to reduce the complexity of the figure.

The player is interacting with the game by sending 'commands' via a user interface and receiving information of the avatar and game world (i.e. screen images showing the avatar in the game world).

This figure shows how the researcher is firmly incorporated into the process of research. There is a complete system that, using the language of semiotics, includes the *referent* (researcher), the thing or object being talked about (game and player) and the words used. The adoption of a critical realist standpoint has placed the referent in the picture (Bhaskar, 2002). However, it is important to remember that existence is independent of observation (Sayer, 2000).

DESIGN RESEARCH METHODOLOGY

In this example of a realist view of games research it is possible to develop compatible methods by bringing scholarly knowledge to the research (Sayer, 2000). Due to the short history of computer games research there are no cookbook methodologies that can be simply applied to computer games, instead an existing methodology may be adapted.

Design research methodology has been used for many years, the Design Research Society (Design Research Society , 2005) has been promoting and disseminating design research practices since 1967. Design research is used in a variety of areas such as education, architecture, graphic design, software development and engineering. The Stanford Center for Design Research (The Stanford Center for Design Research, 2005) has been using design research for twenty years in the field of engineering design. The Journal of Design Research (Journal of Design Research, 2005) covers many disciplines, including architecture, social sciences and education. As a result of this wide variety of applications of design research there are a large number of different varieties of design research. Brenda Laurel's 2003 Design Research: Methods and Perspectives book gives a good overview of the different types of design research and contains articles by researchers working with design research. Nine different approaches to design research are listed, see table 2, including qualitative design research, quantitative design research, experiential design research and so on (Laurel, 2003). This clearly demonstrates the way that design research has been modified and used in many different situations.

• Experimental design research • Qualitative design research • Quantitative design research • Speculative design research • Experiential design research	• Performative design research • Discovery-led/poetic design research • Formal/structural design research • Procedural design research (Laurel, 2003)

Table 2. Nine approaches to design research

Despite the many varieties of design research, they fall broadly into the following three categories (Frayling cited by Lunenfeld 2003): research *into* design, research *through* design and research *for* design. Research into design incorporates historical and aesthetic studies. Research through design utilises design as a component of the research process and tends to be project based. Research for design is to 'create objects and systems that display the results of the research and prove its worth'. The research into games proposed here concentrates on 'research *through* design', consisting of a project to test game play mechanisms or components (which may have been specially designed). This is also the approach recommended by game designer and researcher Eric Zimmerman, the co-author of the book *Rules of Play* (Zimmerman, 2003).

While evaluating designs (game play mechanism designs, for example) the researcher needs to employ methods to gather useful information. Eric Dishman (Dishman, 2003) suggests an 'Ask, Observe, Perform' framework for his design research projects. 'Ask' is about getting information from people, whether at the start of the project when defining the research or at the end when testing a product. 'Observe' is about watching what people actually do. 'Perform' is concerned both with designers putting themselves into the roles of the users of their products and with getting those users to try out and critique 'plausible future scenarios using concept, prototype and product level "props" to simulate future technologies' (*ibid*). Research into computer games designed to run on technologies that do not yet exist fits neatly with the idea of creating '"props" to simulate future technologies.

The 'design' in design research is interpreted in different ways, as indicated by Brenda Laurel's list of nine different types of design research (see Table 2). The Oxford English Dictionary definition of design forms part of the basis for the version of design research described here: "To plan, purpose, intend. To form a plan or scheme of; to conceive and arrange in the mind; to originate mentally, plan out, contrive". (Oxford English Dictionary Online: Second Edition, 1989).

These ideas lead directly to the methodology suggested for games research: to generate a hypothesis, or research question, and then plan and contrive (and build) an artefact or experience that can be used in exploring that hypothesis or answer a question. Vaishnavi and Kuechler (2004) outline a design research methodology on the Association for Information Systems website that may be used for developing software. This methodology comprises five steps: Awareness of Problem (Space), Suggestion, Development, Evaluation and Conclusion with built in feedback loops, allowing the developed artefact to be evaluated and altered and then evaluated again until enough data has been gathered (qualitative and quantitative as appropriate) to reach a conclusion on the veracity of the hypothesis or draw useful conclusions about the research question. Adapting this version of design research methodology for games research enables experimentation with prototypes to evaluate and reveal underlying properties that may lead to generalisable results that are applicable to a wide range of, or even all, computer games. The process is shown in Figure 3.

Game design research methodology is a stratified approach to design that is consistent with critical realism. The design process builds by an iterative process, giving an opportunity for double loop learning (Bednar, 2007), that allows the emergent properties of different game play mechanisms to surface and to take into account the individual interpretation of the game play. This allows the designers the opportunity to observe a game and the emergent properties of the game and utilise these to improve the design. Some emergent properties improve play and may be exploited, others may hinder play and ways of removing, or ameliorating, these may be found.

The underpinning philosophy adopted here, and theory, is flexible enough to allow for events that may come from design or implementation of the game. This also provides a theoretical underpinning to draw on in the game design that can be used as it is acceptable that we can choose a methodology, but will understand it in different ways according to our (ontological) view of the world.

In Figure 4 the critical realist overlapping domains of reality and the corresponding strata of games exist beneath this process, switching in and out of relevance as the process is enacted. For example early in the process the underlying reality, the mechanisms and game rules are considered when becoming aware of the problem space and suggesting hypotheses. In the central development phase the actual events and interface of the game (prototype) are explored. During evaluation, player experiences and engagement become crucial, which then leads directly back to the rules and mechanisms. Then either definitions of game mechanisms may be produced or alternatively the process loops back to 'construct hypothesis' in the 'suggestion' phase to test out a new

hypothesis that has resulted from a modification of the previous one. Figure 4 shows this stratified game design research methodology.

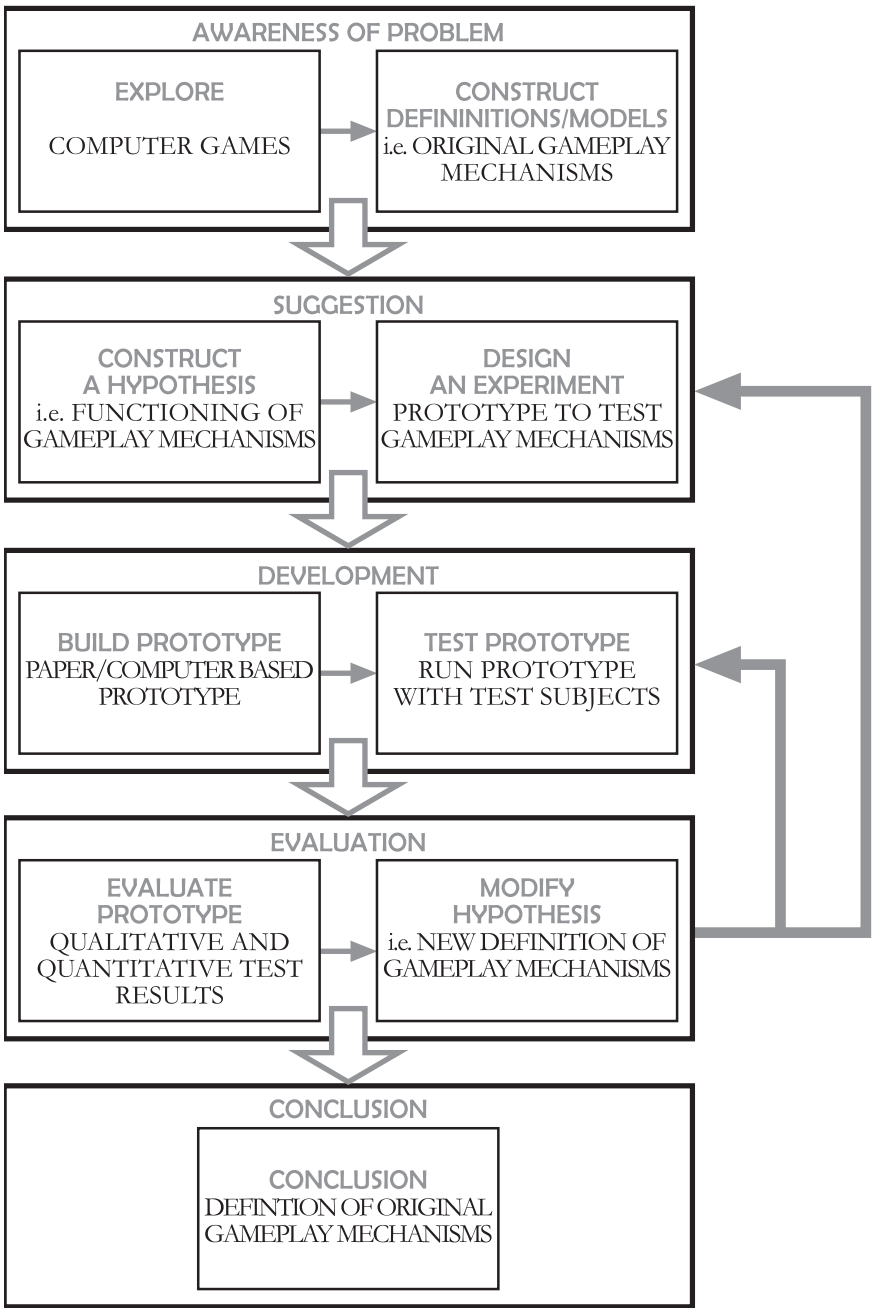

Figure 3. Design research methodology applied to games

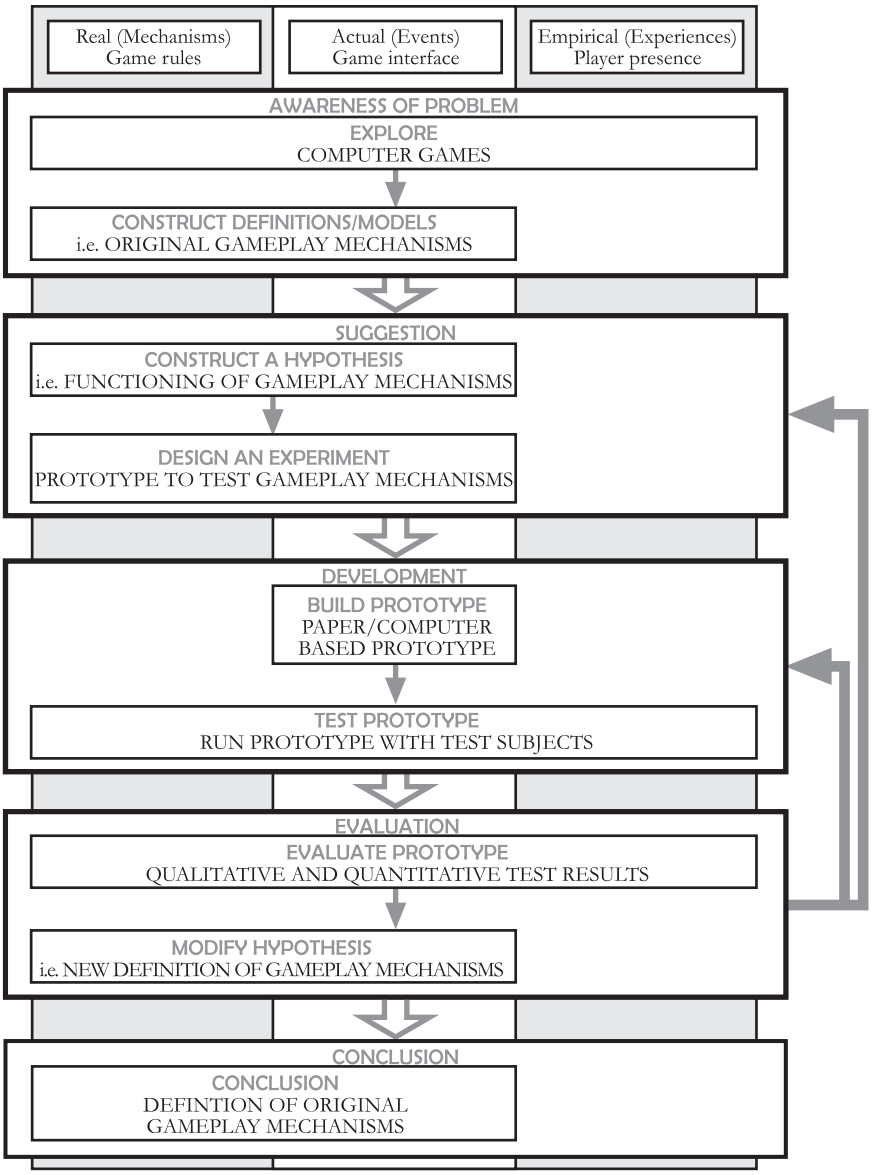

Figure 4. Stratified game research methodology

DEVELOPING GAMES

The loop at the heart of the game design research process, moving the game through the different strata (see Figure 4), is similar to design/development loops frequently used when creating commercial games. Unexpected emergent properties that appear during development may be picked up during testing and can be included in a game's features.

Eric Zimmerman recommends using an iterative design loop when carrying out design research with games (Zimmerman, 2003) in which the researcher 'Designs', 'Tests' and 'Analyses' over and over as they hone in on a game design. As Zimmerman points out this resource intensive way of creating games is not commonly used in this pure form by the games industry. However, there are points during game development when these iterative design loops are vitally important, being frequently used for fine tuning rather than for developing the initial game premise. For example, in the pre-production phase of game development there are opportunities for testing game play ideas before committing full resources to the development. Once the pre-production is complete the game development normally continues in a series of stages, each corresponding to milestone deliverables specified in a development contract between the developer and publisher, who are sometimes both divisions of the same company. Once the beta milestone is reached, and the game is essentially complete apart from debugging and game play tuning, a period of iterative improvement occurs until money or time runs out and the game is considered both robust and fun enough to release.

This model of game development, used since the 1990s, moves through different development lifecycles: waterfall, staged delivery and evolutionary delivery (described by Steven McConnell in his seminal work on software projects 'Rapid Development' (McConnell, 1996)). Figure 5 shows, in a simplified version, how these different lifecycles and iterative loops may be combined when developing a game.

There are many similarities to the game design research methodology, though since the outcome of design research is not usually a robust and fully functioning game, but just those features of a game that are being explored, the time consuming staged delivery phases may be reduced or removed altogether, linking the pre-production phase directly to the 'Game play tuning and debugging' phase of development. The researcher has some initial thoughts and ideas they want to explore (preproduction) and then moves to a variation on the final evolutionary delivery phase of development, where they may test their ideas out with an evolving prototype. A researcher may just wish to experiment with a single game play mechanism, for example comparing real time and turn based combat. To do this they may create a prototype game that can be switched between these two modes of combat. A full game is clearly not required for this, just a simple prototype that is only fully realised in the target area. However, players may be given the illusion that they are playing a prototype of the full game, even though they are only asked to look at one narrow area. Further, the prototype should ideally be easily modifiable so that as the experiment progresses it may be changed in response to feedback during evaluation and data gathering. The creation and the evaluation of the prototype are crucial phases of this process.

PROTOTYPING AND NEW TECHNOLOGIES

Technology used for games moves forward extremely quickly with new console platforms appearing every couple of years and PC and mobile phone game technologies constantly moving forward month by month. This con-

stant evolution of technology can result in unpredictable, emergent game play, similar to the emergent phenomena predicted by critical realism. Critical realism provides us with a useful lens through which to view these technologies and encourages us to consider their effects on more than one level. We are not just concerned with how fast a processor is, but with new game play that is enabled by this additional speed and the responses of the players to this new game play.

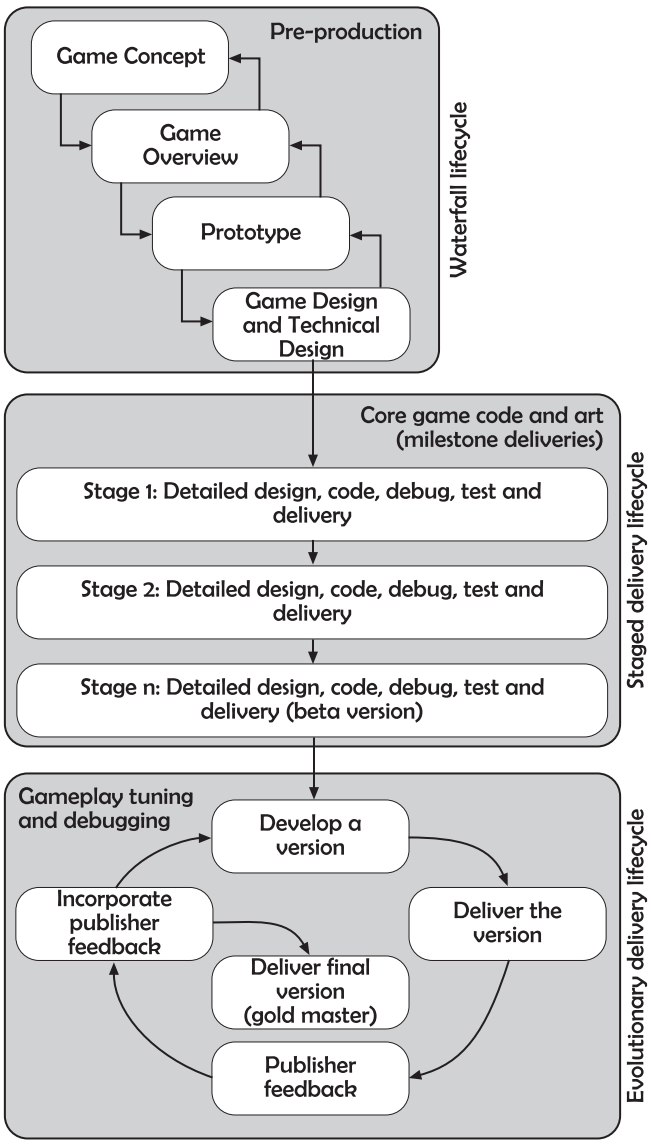

Figure 5. Game development lifecycle

There are different ways of approaching this constant evolution. Researchers may take an established gaming technology and design experiments around it or they may simulate future technologies and carry out experiments with these simulations, looking to future developments. In May 2003 Celia Pearce suggested on the International Game Developer Association website that academic researchers have the 'luxury of both studying the past and imagining the future five, ten, twenty years out' (Pearce, 2003). Gaming technology moves forward so rapidly that some gaming technology around now will be looking dated in less than five years. Developers often surf on the wave front of new technology and do not have the luxury of looking further ahead than the next game platform as they rush to release products. Academic researchers may not be constrained by the need to get games to market. They can study games and technologies that do not yet exist without the same commercial pressures that game developers have.

Paper prototyping has been widely used to design, test and refine user interfaces (Snyder, 2003). The advantage of paper prototyping is that the actual computer technology does not have to be implemented in order to determine how a system appears to the user. The developer creates paper sketches of screen interfaces that testers can use in place of fully functioning interfaces. A facilitator takes on the role of the computer manipulating the paper 'screens' as the tester acts out clicking on buttons etc. Further members of the paper prototyping team, the observers, watch and make notes on what happens (and can talk with the participants) (*ibid.*). In Wizard of Oz testing a person acts as an intermediary between a technology and the user. This can be used for systems where the responses of the system are too complex to be easily represented on paper (*ibid.*). Using combinations of paper prototyping, Wizard of Oz testing and simple computer generated prototypes enables researchers to simulate advanced systems that do not yet exist.

Evaluation may be built into these prototyping systems allowing the researcher to start generating data very quickly by means of questionnaires, interviews, observation, focus groups and so on. The prototype may be designed to allow quantitative data to be generated; for example, timing response times, number of events, physiological responses and so on.

The rapid generation of data and the flexibility of this prototyping process allows the researcher to respond rapidly and, if necessary, modify the prototype. This rapid reaction to information keeps the iterative loop at the heart of this game design research methodology tightly wound. The researcher is expected to refine the experiment while it is running, modifying the prototype each time round the loop and responding to emergent properties.

A HOLISTIC APPROACH TO GAME DESIGN RESEARCH

The game design research methodology described here has been specifically developed to facilitate the design of games for future technologies. Games can be large complex systems in which game play mechanisms interact with each other and may create (ideally) a coherent experience. Poorly designed games

in which the game play is fragmented jolt the player out of the illusory worlds created – this is self evident to game players (though perhaps research is needed to confirm this). Game design research allows the researcher to directly experiment with individual game play mechanisms and emergent properties but in the holistic context of simulations of complete games. The simulation may appear to be of a full game, even though the players are focussed on one narrow area of the game. This allows the researcher to investigate some of the experiences of the players, as they play what they may believe to be a simulation of a full game, not just a simulation of a single game play mechanism. Game play may be an emergent property, or event, of more than one game play mechanism that is used by the players. This emergent game play may not become apparent if the game is reduced and separated too far into its simplest components and cannot necessarily be derived from the mechanisms. Consequently game design research is not a reductive methodology but supports a holistic approach, allowing examination at different levels or strata. As predicted by critical realism, emergent phenomena, entities and structures may not be predicted by examining properties of the things that generate them. The design research methodology allows the creation of game designs without alienating the user, emergent properties or an objective view of the world. These facets help develop a unified approach to game design.

Game play mechanisms have been set in the context of full games, which in turn have been set in a wider context of simulated technologies. The wider context also includes game genres and different gaming platforms. Additionally the methodology has been viewed through a critical realist lens which has set a perspective, and foundation, not only for the way the games operate, but also for selecting a design research methodology. The paper prototyping process described is consistent with components of the development process within the games industry.

Simulating the whole game system (albeit in a Wizard of Oz fashion with smoke and mirrors), rather than a single isolated element, allows the researcher to consider the differently layered components and emergent phenomena and to take a holistic approach to game design research.

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