PATHS, PLAYERS, PLACES:
TOWARDS AN UNDERSTANDING OF MAZES AND SPACES IN VIDEOGAMES

ALISON JANE GAZZARD

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ABSTRACT

This thesis contributes to the field of academic game studies by reworking and updating the established theories of Espen Aarseth, Janet Murray and Marie-Laure Ryan in understanding the path in videogames. It also draws upon the more recent theoretical discussions of figures such as Jesper Juul, Lev Manovich, Frans Mäyrä and James Newman in order to explore the player's experience along these paths in the gameworld. By defining a vocabulary of routes through space, the thesis uses the maze in particular as a way of understanding the paths of videogames.

The research starts by examining our cultural understanding of the maze within videogames. Various mazes around the UK were walked in order to understand their design and how this may translate into the virtual world of the videogame. The thesis examines the uses of real world mazes through the work of Penelope Doob, and Herman Kern to discuss how the videogame may rework our cultural understanding of the maze due to its increasingly ubiquitous nature. This enables a discussion of maze-paths found within many videogames that are not necessarily categorised by what is often discussed as the maze genre of games. A morphology of maze-paths is devised through comparing the mazes of the real world and the virtual mazes of the videogame. This is achieved by breaking down the maze into separate path types and shows how these paths may link to one another.

The thesis argues that the paths of the videogame are generated by the player's actions. Therefore the focus of this thesis is on the player's experience along these paths and the objects found at points on them. In acknowledging how to overcome obstacles along the path it is also possible to understand the role of the path in the player's learning and mastery of the gameworld. This leads to discussions of different types of play experienced by the player in the videogame. Play is separated into what I term purposeful play, being the activities intended by the designer, and appropriated play which is the play formed out of the player's exploration of the game system. These two terms help to understand player's incentives for playing along the ruled paths of the gameworld as well as exploring the game's system further to find new types of play outside of the pre-determined rules.

As this thesis is concerned with videogames involving the player's avatar having a direct relationship with the path, the research also investigates what happens when certain devices break these paths. It was discovered that warp devices reconstruct both temporal and narrative elements within the gamespace, and cause the player's avatar to temporarily move

on tracks through the gameworld. In defining a vocabulary of movement through space on a fixed track, as opposed to a player-determined path, there is a further understanding of the player experience related to each type of route taken in the game.

Through an understanding of the maze and defining a vocabulary of maze-paths, tracks and objects found along them, this thesis adds a new contribution to knowledge. It also acknowledges the importance of different types of play within videogames and how these can shape the player experience along the paths of the game.

1. INTRODUCTION

In 2006, I found myself wandering between the concrete blocks of the Monument to the Murdered Jews of Europe near the Brandenburg Gate in Berlin. Not knowing anything of the histories or meanings behind its construction and design I made my way down one path between the blocks. All of a sudden the perspective shifted from seeing a landscape of different blocks to walking in amongst them and finding myself immersed deeper into a space of concrete towers metres high, surrounding my every view. Walking further into the memorial I explored the sections of paths at various crossroads, wondering what was around each corner. Moving from one side of the memorial to another the path takes you from an aerial view above the blocks (Figure 1.1), to being immersed amongst the towering grey concrete structures (Figure 1.2), to returning to the other side and being faced once again with an overall view of the memorial's layout. One viewpoint does not relate to the other in terms of the experience of the different blocks until the path itself is walked. Walking in amongst the memorial changes the relationship with the landscape. It is possible to feel lost within the confines of the structure as you walk further in amongst the taller concrete blocks and your view starts to become more restricted. The memorial created a feeling of being lost even though the pathways out of the walled landscape were clearly marked. This same feeling is created through walking a maze, except this time decisions have to be made in order to reach the finish and find the way out of the bounded walls. The maze can be seen to rework a path, and the act of walking a path, into something of additional significance. This research focuses on the paths and mazes of the real world as a way of then discussing how the videogame may rework our understanding of the maze in a virtual world.

The physical mazes of the past have to be visited whereas the virtual mazes of today are readily available through artefacts such as computer games. Game designers Andrew Rollings and Ernest Adams discuss the use of the maze in game design.[1] However, there has been little research into how the development of display media such as the computer game has changed cultural perspectives of mazes. It is this key question of 'do videogames rework our idea of the maze' that is the starting point of this thesis.

[1] Andrew Rollings and Ernest Adams, *Andrew Rollings and Ernest Adams on Game Design.* (Indiana: New Riders, 2003), 231.

Figure 1.1 Overall view of Monument to the Murdered Jews of Europe, Berlin, 2006

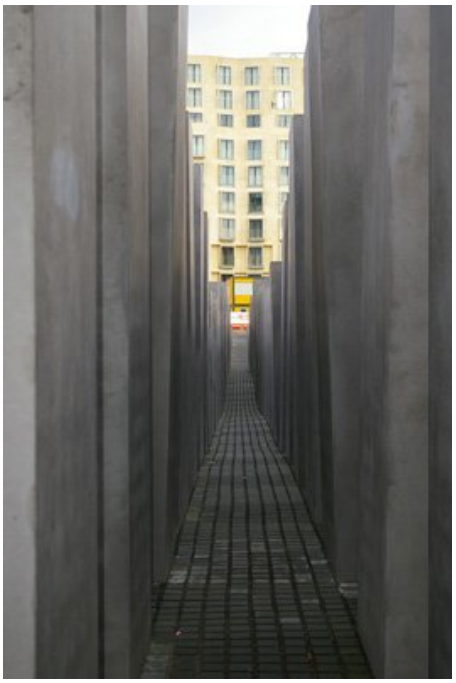

Figure 1.2 View from path inside Monument to the Murdered Jews of Europe, Berlin 2006

In playing a videogame the player controls events in the gameworld by use of a game controller or the button presses and mouse moves of peripheral devices attached to the computer terminal. These movements translate to actions on screen as can be identified through Janet Murray's notion of "agency" which is "the satisfying power to take meaningful action and see the results of our decisions and choices."[2] It is these actions that allow players to move their avatars through the space of the videogame whether it is through

[2] Janet Murray, *Hamlet on the Holodeck* (New York: The Free Press, 1997), 126.

displayed text or a represented character moving through a virtual three-dimensional world. The issue of spatiality has been discussed since early writings of videogames and related media but there has yet to be a defining vocabulary that underlines these experiences of the player.[3] What became clear through walking the memorial in Berlin was that the path I walked became generated by my actions. The experience of the path unfolded as I gradually created my own route in amongst the blocks. The same can be said of the videogame. Although the spaces of the videogame may seem bounded by technological constraints, the routes through these spaces are generated by the actions of the player moving their avatar along various paths. Therefore although the design of the game may imply that particular routes are taken, it is the player that determines their own route on each playing. Of course, there are those games that do not allow the player such freedoms, and can be seen to use tracks rather than paths forcing the player to move their avatar in one direction only.

As will be seen through the literature review in Chapter 2, the concept of games being on rails (or tracks) and other related concepts of the path and the maze are often used interchangeably throughout contemporary game theory. It is the purpose of this research to understand the different routes through gamespace and why the maze itself can be seen as a special type of route. It is through a focus on the maze that terminologies such as route, path, maze and track are defined in Chapter 3. By defining a vocabulary in the initial stages of the thesis the concept of the maze can be explained in relation to these other terms that are often used as metaphors for experiences within the discussions of interactive media. The notion of the path in particular stems from Espen Aarseth's discussions of "ergodic texts" in his seminal work *Cybertext*. Aarseth states that "ergodic texts" require "work along a path" in order to experience them.[4] In this sense it is possible to see this thesis as an extension of the work of Aarseth and earlier theorists within the histories of game studies. This thesis revisits such works in order to understand and re-evaluate key terms discussed in them. Terms such as maze are often used as a general overview of an experience or as a metaphor or genre of a particular type of gameplay without further consideration of what actually constitutes a maze design.

[3]For early writings about spatiality see, Espen Aarseth, *Cybertext: Perspectives on Ergodic Literature* (Baltimore: John Hopkins University Press, 1997), Brenda Laurel, *Computers as Theatre* (Boston: Addison-Wesley, 1993) and Janet Murray, *Hamlet on the Holodeck*.
[4] Espen Aarseth, *Cybertext: Perspectives on Ergodic Literature*. 1.

The literature review discusses the concepts of Aarseth's "ergodic texts" as well as other theories of the path detailed by both Janet Murray[5] and Brenda Laurel[6] in their exploration of hypertexts and the possible constructions of narrative through these and related media in the early 1990s. These texts form the basis of a discussion that then goes on to consider more recent theories in contemporary game studies. It is through an analysis of more recent literature that gaps started to appear as to how space is discussed within videogames, and this is discussed in Chapter 2. In order to understand the maze as opposed to different routes through space, terms such as route, maze, path and track are defined in Chapter 3. This provides a glossary of terms for this thesis that is then built upon and explored further in subsequent chapters. Alongside core definitions the methods for approaching this approach are detailed within Chapter 3. In order to understand the player's relationship with the path, games viewed from a first-person and third-person perspective became the primary case studies detailed throughout this work. Early on in the research it became clear that the notion of the avatar and its relationship with space was a separate line of enquiry. This is outlined in Chapter 3 where games are split into two categories of those containing direct paths as opposed to those containing displaced paths. These categories enabled an understanding of the direct relationship of the player/avatar with the path and which game genres were of interest to this research. This was developed using Jesper Juul's mappings of "play time" (the time existing within the real world) to that of "fictional time" (the time occurring within the game).[7] To be able to discuss the generative nature of the path in such a way the research was limited to a discussion of those games that had a one-to-one mapping of "play time" to "fictional time". It was seen through further investigations as outlined in Chapter 3 that the two genres of games capable of producing this mapping are those with avatarial positions of first-person and third-person.

After outlining a vocabulary in Chapter 3, Chapter 4 starts to answer the question of whether 'videogames rework our idea of the maze'. This is primarily answered through the work of Penelope Doob[8]. Doob is discovered as a key figure in the understanding of the histories and meanings of the maze. She is identified as a key theorist through the work of Aarseth. Doob's work focuses on the histories and cultural understanding of the maze from the ancient to the

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[5] Janet Murray, *Hamlet on the Holodeck*.
[6] Brenda Laurel, *Computers as Theatre*.
[7] Jesper Juul, *Half-Real: Video Games between Real Rules and Fictional Worlds* (Massachusetts: MIT Press, 2005), 142.
[8] Penelope Doob, *The Idea of the Labyrinth from Classical Antiquity through the Middle Ages* (Ithaca: Cornell University Press, 1990).

mediaeval periods. I used this enquiry as way of exploring the relationship between the real world maze and the maze in the videogame. Chapter 4 discusses the uses of the maze throughout history, concentrating on the work of Doob to show how the maze may now be experienced differently through the videogame. There are many instances where the maze is used as a metaphor for some interactive experiences or genres of videogame, yet the terminologies surrounding the maze are not often explored through their histories. One of Doob's main findings was that the maze can be viewed as a design or understood as an experience, and that the experience of being in the maze is markedly different from that of viewing the maze as a design from above. As the videogame often puts the player in the position of being able to experience both of these factors, Chapter 5 questions the differences between the map (maze view) and experience of various videogames.

In order to understand the maze further I walked various mazes and labyrinths in the real world throughout the UK (as well as some further afield). It was through the experience of the worldly maze, that it became clear that these mazes were in fact constructed of various path types with their own experiences attached to them. In separating the maze as map and experience in Chapter 5 it is the experience of the maze that is then developed further throughout the rest of the thesis. It is at this point that the thesis shifts towards an understanding of the player experience, which is only possible after a discussion of the two components of the maze. It is in Chapter 6 that the player experience within the videogame is discussed in particular those experiences related to playing along the path. It recognises how the study of videogames as artefacts cannot be seen in isolation to the player experience. The player's experience is discussed through an examination of Roger Caillois' theories of play.[9] The player's experience of the overall designed paths of the gamespace are explored through Lev Manovich's concept of the "algorithm"[10] (what the player seeks to discover within the gameworld). This also includes those paths not necessarily defined by the designer through the act of what I term appropriated play. In understanding the player experience it is recognised that writing about videogames can be discussed through an analysis of "the game, the player and related contextual frames."[11] This concept was developed further into the idea of cultural logic of play that recognises how players rarely play in isolation. With the growth of the Internet with specialist gaming forums, as well as gaming magazines, the player's experience can be shaped through a discovery of what the game can offer them. These

[9] Roger Caillois, *Man, Play and Games* (Chicago: University of Illinois Press, 1958).
[10] Lev Manovich, *The Language of New Media* (Massachusetts: MIT Press, 2001).
[11] This is defined in Frans Mäyrä, *An Introduction to Games Studies: Games in Culture* (London: Sage Publishing, 2008), 2.

discoveries can be developed through other players exploring the system and the player wanting to get value for money from the game itself. The player's experience is measured through an understanding of the cultural context of videogames, ideas about how games can be played and ways in which they can be discussed amongst peers.

It is through the idea of cultural logic and understanding the experience of the player along the overall paths of the videogame that new vocabularies are defined for discussing these experiences of the path. It is here that the experience of the maze-like paths are then broken down into what can be termed a "maze-eme" (the separate paths of the maze) in Chapter 7. It is in Chapter 7 that a morphology of maze-paths is developed through an evaluation of both videogame and worldly maze paths. Various paths are identified that relate to the maze such as the dead-end. As well as showing how the paths of the videogame maze may be different to the paths found within the worldly maze, each path is considered in terms of the player experience along it. This is discussed through the objects found along various paths and how these objects may relate to the opening up of future paths to explore. The use of a morphology can be seen as a contribution to knowledge. It provides a way of categorising the paths of the videogame and shows how a set of rules can emerge as to how each path may link to one another. In separating out path types and their characteristics, it is possible to see how the structure of the maze can be used to discuss many different types of videogames and not only those labelled with the maze genre. The morphology is developed as a way of discussing these experiences from a player-centred point of view rather than from a design-led perspective. Chapter 7 details how paths can be linked together due to the situations and devices found along them, and how this linking of paths helps to identify how players can learn through the construction of various paths in the gameworld.

In understanding the player's experience along the path and how it cannot be separated from the objects found along it, Chapter 8 discusses the concept of warp devices. Both Barry Atkins[12]and Jesper Juul[13] have discussed how temporal and spatial elements can be reconstructed in virtual spaces, yet the warp device does not seem to have been subject to further enquiry. The identification of path structures in Chapter 7 leads to a question about what happens when the path is broken. The issue of time within the gameworld is revisited through an understanding of how the warp can change the one-to-one mapping of "play time"

[12] Barry Atkins, "Time in Prince of Persia: Sands of Time", in *Videogame, Player, Text,* ed. Barry Atkins and Tanya Krzywinska (Manchester: Manchester University Press, 2007), 231.
[13] Juul, *Half-Real: Video Games between Real Rules and Fictional Worlds*.

to “fictional time”. This is seen through a detailed discussion of various types of warp device outlined in Chapter 8, showing how paths can be turned into tracks through the use of such devices. This distinction between the path and track is again linked to the player experience and how breaking the path can affect play and learning as well as the player’s relationship with navigation through the gameworld. It also clears up misconceptions about the associations of labyrinth paths (discussed as being unicursal and constructed of only one path) that are commonly compared to rail or track-like games.[14] Both the construction of the morphology of paths and the objects found along the path are part of this thesis’ contribution to knowledge as the notion of the player defined, generated path is discussed rather than the game design construction as a whole. This relates to how the player experiences the game on a path-by-path basis, rather than a reflection on the whole game once it has been completed. An additional contribution to knowledge is through the theories I have developed surrounding the warp device and what this means in terms of player experience and the relationships between both paths and tracks within the gameworld. Although game designers in constructing and understanding the game design experience for first-person and third-person games implement these theories of paths, mazes, tracks and objects in their designs, this thesis also impacts upon other areas. By reworking and building upon Aarseth’s theories of “ergodic texts” this thesis is an extension of other work in the area of contemporary videogame studies. It constructs a vocabulary and set of new theories that can be used by others in the future as a way of enriching the cultural understanding of videogames and their players. The thesis also exists as a new set of building blocks to be expanded upon by others as it opens up new ways of discussing the way players’ can move their avatars through gamespace.

[14] See Clara Fernández-Vara, “Labyrinth and Maze”, in *Space Time Play, Computer Games, Architecture and Urbanism: The Next Level* ed. Friedrich von Borries, Steffen P. Walz and Matthias Böttger (Basel: Birkhauser, 2007), 74.

2. GAME STUDIES: PATHS, MAZES & SPACES

2.1 Introduction

> The diversity of what has become known as the discipline of 'game studies' is quite impressive. Enquires range from investigations of the economics of the videogame industry (e.g. Kerr 2006) through large-scale ethnographic surveys of online communities and Massively Multiplayer Online Role-Playing Games (e.g. Taylor 2006; Castronova 2005), to interrogations of the representations of gender in games (e.g. Cassell and Jenkins 1998) as well as more general introductions to the field (e.g. Newman 2004, Carr *et al*. 2006; Dovey and Kennedy 2006) and readers that attempt to bring together a diverse range of perspectives sometimes combining academic and practitioner approaches and commentaries (e.g Wolf and Perron 2003) in a refreshingly and helpfully multidisciplinary manner.[15]

As the above quote from James Newman shows, studies of videogames are wide ranging and draw on many disciplines. This thesis discusses the videogame as a cultural artefact. It is through this chapter that current game studies surrounding issues relating to paths, mazes and space are examined in order to provide a background and analysis for issues central to this research.

The histories of game studies have often been linked back to the two seminal works, Janet Murray's *Hamlet on the Holodeck*[16] and Espen Aarseth's *Cybertext*[17]. Both published at the end of the 1990s, they offer different perspectives on videogames, yet at the same time are comparable in that they both do not primarily discuss just videogames. The late 1980s saw theorists writing about the narrative possibilities of hypertexts and the multi-threaded nature of the Internet.[18] This soon spread to encompass earlier videogames especially text-based games and MUDs (multi-user dungeons or domains) that are often linked to early adventure games. Murray's focus is on narrative and what the new media of hypertexts and interactive fictions may offer the user/player. Her work is often classified within the realm of narratology, although this term only emerged as a field of videogame study after the term ludology appeared as a new way to classify videogames as opposed to other media.

As videogame theory started to assert itself as a study in its own right at the end of the 1990s, the term ludology was used more frequently. According to Jesper Juul's research, this term

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[15] James Newman, *Playing with Videogames* (London: Routledge, 2008), 8.
[16] Murray, *Hamlet on the Holodeck*.
[17] Aarseth, *Cybertext: Perspectives on Ergodic Literature*.
[18] For the histories of hypertexts see, Jay David Bolter, *Writing Space: Computers, Hypertext, and the Remediation of Print* (London: Lawrence Erlbaum Associates, 2001).

was used "as early as 1982, albeit scarcely and with a different meaning."[19] Gonzalo Frasca, however, more notably re-coined the term stating that "ludology can be defined as a discipline that studies games in general, and videogames in particular."[20] This thesis is not concerned with the labelling of ludologists vs narratologists (or vice versa), but understanding the distinction here shows how theories of videogames have shifted and developed. As Frasca notes in his paper "Ludologists love stories too: notes from a debate that never took place", ludologists do not necessarily dismiss theories of narrative in videogames.[21] However, what is clear is that for ludologists narrative is not the key function of videogames. Other characteristics such as interactivity, player:avatar relationships, rules, and what is means to play, are all possible factors involved in discussing this ever growing medium.

Since 1999 key theorists such as Juul, have explored the conceptual structure of videogames and what constitutes a game. Although theories of traditional play and games already existed in the works of Roger Caillois[22], Johan Huizinga[23] and more recently Brian Sutton-Smith[24] these are still being continually reworked to try and understand what videogames offer as a media form.

Juul defines the following categories as to what constitutes a game:

1. Rules.
2. Variable, quantifiable outcome.
3. Valorization of outcome: the different possible outcome of the game are assigned different values, some positive and some negative.
4. Player effort.
5. Player attachment to outcome.
6. Negotiable consequences: The same game [set of rules] can be played with or without real life consequences.[25]

His diagram defines what he terms "games", "not-games" and "borderline cases" (see Figure 2.1). In trying to state what games are Juul leaves "free-form play" out of the category of

[19] For this discussion see, Gonzalo Frasca, "Ludologists love stories, too: notes from a debate that never took place" (paper presented at DiGRA, Utrecht, Netherlands, 2003).
[20] Gonzalo Frasca, "Simulation versus Narrative: Introduction to Ludology", in *The Video Game Theory Reader*, ed. Mark J. P. Wolf and Bernard Perron (London: Routledge, 2003), 222.
[21] Frasca, "Ludologists love stories, too: notes from a debate that never took place."
[22] Caillois, *Man, Play and Games*.
[23] Huizinga, *Homo Ludens: A study of the play element in culture*. (New York: J & J Harper Editions, 1970).
[24] Brian Sutton-Smith, *Toys as Culture*. (London: Psychology Press Ltd, 1986).
[25] Juul, *Half-Real: Video Games between Real Rules and Fictional Worlds*. 36.

"games" and instead lists this as a "not-game". Placing "free-form play" outside of the diagram raises the question of whether players can play outside of the rules of the game. This secondary research question is answered in Chapter 6 as a way of understanding playing on and off the intended paths of the gameworld.

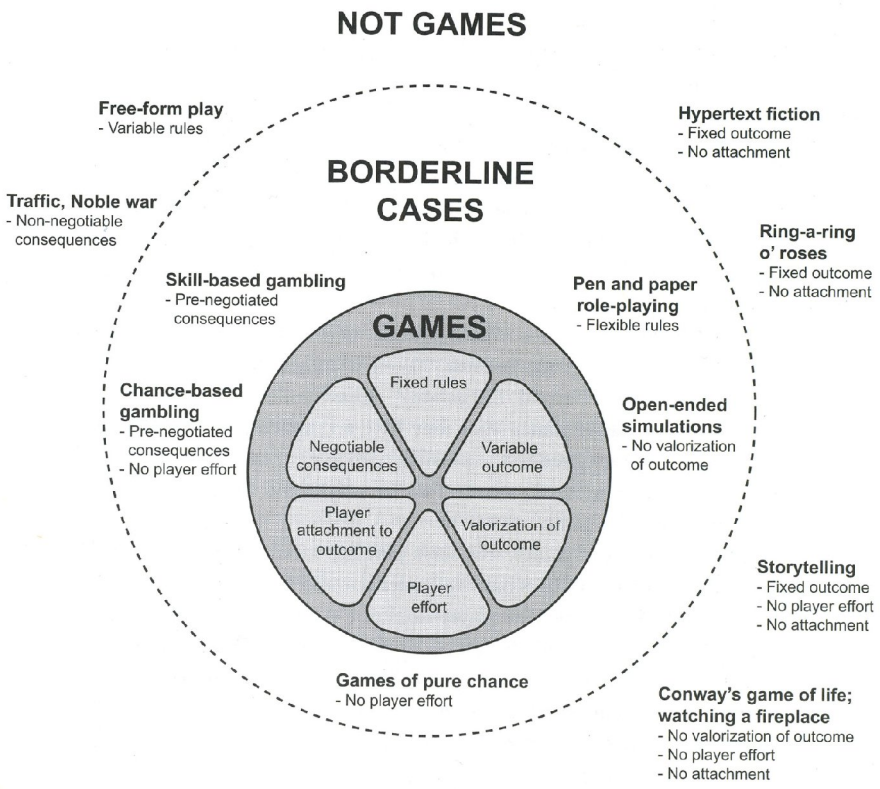

Figure 2.1 On the borders of the classic game model.
Juul, *Half-Real: Video Games between Real Rules and Fictional Worlds*. 91.

One of Huizinga's definitions of play – and a key theoretical concept - is that "Play is distinct from 'ordinary' life both as to locality and duration."[26] Huizinga also discusses the idea of the "magic circle" as the place where games occur; separate to other activities within peoples lives.[27] As noted by Dominic Arsenault and Bernard Perron some theorists have contested using ideas of the magic circle from traditional game theory within discussions of videogames. Writing about Daniel Pargman and Peter Jakobsson's paper "The Magic is Gone: a Critical Examination of the Gaming Situation" it is stated that "there is not a strong boundary anymore between games and ordinary life in our digital world, and that games play many different roles and fill many other functions than those related to 'fun', 'specialness',

[26] Huizinga, *Homo Ludens: A study of the play element in culture*. 9.
[27] Huizinga, *Homo Ludens: A study of the play element in culture*. 9.

and 'other-worldliness'".[28] This once again shows how the mapping of traditional game theory onto videogame theory is not always straightforward, and that the "remediation"[29] of theories from different schools such as narratology, game theory, film theory, etc, need clear analysis and often require reworking further in order to produce an understanding that works within a discussion of videogames.

What many theorists do agree on however is the definition of a game having rules. As Juul states "a game is a ruled-based system with a variable and quantifiable outcome."[30] This is vital to understanding videogames and in many ways the player experience. It is through a definition of game rules and how it is possible to play outside of these rules, that Chapter 6 becomes the point in the thesis where it is clear how important the player experience can be in understanding how gamespaces are negotiated. This will draw on issues surrounding Caillois' two distinct categories of play, that of "paidia" and "ludus". Writing in the 1950s, Caillois defines various relationships between different games and playing, with the two extremes of play being that of "paidia", which is defined as "…wild, free-from improvisational play…"[31] and "ludus", defined as being "complementary to and a refinement of paidia."[32] In other words, ludus can be seen as play that now exists through a set of rules. These two definitions are often called upon by more recent game theorists especially as videogames have become larger in terms of the spaces they offer players and issues of exploration linked to these spaces. Analysis of these terms and other theorists opinions surrounding them will be uncovered further in later chapters, but they are recognised here as a starting point as to the range of sources that have been examined in researching this thesis.

The discussion so far highlights how difficulties and debates frequently arise by theorising videogames in terms of narrative and in comparison to non-digital games. Instead of being grouped with other media, videogames have become a discussion point as culturally distinct artefacts. As stated by Nate Garrelts in the introduction to *Digital Gameplay*, "…the rapid development of the medium has made modern digital games studies a necessarily difficult

[28]For reference to the original paper see Dominic Arsenault and Bernard Perron, "In the Frame of the Magic Circle: The Circle(s) of Gameplay." In *The Video Game Theory Reader 2*, ed. Bernard Perron and Mark J. P. Wolf (New York: Routledge, 2009), 111.
[29] Jay David Bolter and Richard Grusin, *Remediation* (Massachusetts: MIT Press, 1999).
[30] Juul, *Half-Real: Video Games between Real Rules and Fictional Worlds*. 36.
[31] Caillois, *Man, Play and Games*. 36.
[32] Caillois, *Man, Play and Games*. 29.

task."[33] Being able to discuss videogames as their own separate media type does not dismiss other theories from literature, narratology, hypertexts, interactive media and non-digital game studies, amongst other sources. What is important, however, is to understand how ideas can be reworked to discuss videogames and how vocabularies may have to be redefined or recreated. This literature review acts as a timeline of the theories about videogames as they started being developed in response to this growing media. The review highlights the comparisons made with other media that are growing concurrently to videogames, and the importance of developing a vocabulary for the discussion of our cultural relationships with videogames as a medium within their own right. It analyses the gaps within current theories and links ideas that have yet to be seen in conjunction. After this general introduction to those key theories relevant to this thesis, other theories will then be called upon in more detail at various stages in amongst the other chapters. For now, this literature review starts in the beginning, with the roots of videogame theory found in amongst discussions of hypertexts, narrative, text adventures and the interactivity of related media. It is a starting point for the discussion of theories of the path, mazes and spaces within videogames (and related media) that formed the original research question of this thesis; do videogames rework our cultural understanding of the maze?

2.2 The Paths of the Hypertext

The discussion of the labyrinth and the maze – and in turn the paths these constructs offer the user/player/reader – have their roots within narratology. As stated previously, the work of Murray is often referenced in the initial discussion of videogames. Although her work is primarily concerned with that of the hypertext and the emergence of "interactive fictions", there is a lot of crossover between various media at this stage. Ted Nelson coined the term "hypertext" in the 1960s. He states "By 'hypertext', I mean non-sequential writing - text that branches and allows choices to the reader, best read at an interactive screen."[34] Hypertexts were not originally constructed as ways of creating different narratives but as a way of linking together pieces of information. It was a way of extending the formal structure of codex literature by using hyperlinks to link together text such as footnotes and endnotes so that readers could traverse the information in different ways. The term has since been used in relation to internet based web-pages containing both text and imagery, and it was in the early

[33] Nate Garrelts, "Introduction: Negotiating the Digital Game/Gamer Intersection." In *Digital Gameplay*, ed. Nate Garrelts (Jefferson: McFarland & Company, Inc, 2005).
[34] Ted Nelson, *Literary Machines.* (Swarthmore, Pa: Self-published, 1981).

1990s, through key theorists such as Murray, Laurel and Aarseth, that the use of hypertexts started to be analytically critiqued and developed.[35]

Alongside the development of the World Wide Web and the Internet, the text adventure game started to become more accessible online through university based LANs (local area networks). Text adventures eventually filtered out onto the Internet with the growth of technology and increase in modem/download speeds. Murray's work is concerned with narrative and how users/readers/players started to experience narratives in new ways through the clicking of hyperlinks. She is also concerned with the ways in which this developing technology allowed for changes in displaying and understanding emerging narrative forms. At the forefront of Murray's discussion are the narrative components of digital media during the 1990s, and through stating the "pleasures of navigation" in the discussion of "agency" Murray turns her attention to the "story in the maze".[36] It is this focus on the user/player's actions and their importance within the role of narrative that initiates the interest in how stories can be constructed in the hypertext and videogame text adventure. Murray starts her "story in the maze" sub-section with references to the text adventure of *Zork*[37] and "maze-based combat games". There is a clear reference to videogames emerging at this time – both text-based and those with graphical displays. The maze, as discussed by Murray, is used as a metaphor for the surrounding narrative associated with such games. Taking the maze back to its roots in Greek mythology, with the story of Theseus and the Minotaur, Murray relates it to defeating monsters and creating choices. The focus is on the decisions faced by players, in particular moral decisions as to where the maze may take them after deciding on one set of options over another. There is little discussion of the multiple path structures through the narrative that the maze can offer. Instead, the maze (even with its choices and multiple routes), is seen as directing the player to one goal with a "single solution". Murray insists that the maze does not allow for exploration, and it is in fact the "rhizome" that allows the player more freedom stating that; "Walking through a rhizome one enacts a story of wandering, of being enticed in conflicting directions."[38] This form of narrative is seen as one where there is no definite end and the possibilities are on going. Confusion between Murray's idea of the maze and the rhizome are seen through her discussion of the latter as having "multiple paths

[35] See Murray, *Hamlet on the Holodeck*, Laurel, *Computers as Theatre* and Aarseth, *Cybertext: Perspectives on Ergodic Literature*.
[36] Murray, *Hamlet on the Holodeck*. 130.
[37] *Zork* (Tim Anderson et al, 1977-1979).
[38] Murray, *Hamlet on the Holodeck*. 133.

to explore".[39] Defining the rhizome in this way starts to draw comparisons between the maze and the rhizome, yet each offers a different path structure.

The rhizome is generally used as a new way of thinking about digital media, particularly hypertexts. Gilles Deleuze and Félix Guattari, the founders of the reworked concept of the rhizome state that "any point of a rhizome can be connected to anything other, and must be. This is very different from the tree or root, which plots a point, fixes an order."[40] Although the rhizome is seen as the next stage of path structure for Murray in terms of narrative possibilities, technological constraints can restrict the construction of its structure. Videogames can often be thought of as having a structured start and end point in terms of narrative but this cannot be seen as the sole focus of the gameplay. Although the ways of reaching the end of a game may be different, and indeed the end point can be subject to change, the paths of the videogame cannot necessarily all be linked by a network of nodes. Some game paths may have dead-ends, either deliberately constructed or encountered through player skill or frustration. The dead-end in itself breaks the idea of the rhizome network within videogames. If we understand games as being "ruled systems"[41], it is often these rules that reveal how new paths are unlocked. Therefore, videogame paths cannot be seen as purely narrative, but other ludic elements have to be taken into account when discussing path structures. Although the idea of the rhizome, and the mass of networks it conveys may be possible as a metaphor for hypertexts in terms of narrative structure, to map this directly onto the videogame would require analysis of both ludic and narrative elements. To discuss the rhizome without further discussion of maze and labyrinth paths implies a new structure being used to describe emerging media constructs without further discussion of where the maze as metaphor, design and experience can be used.

Murray's concepts in relation to narrative are therefore limited within the field of videogames due to the medium being more than just narrative constructs. The player is concerned with the interaction and play elements of the game alongside any narrative elements that may appear. Although Murray discusses immersion and agency, the notion of the interlinking nodes of the rhizome do not appear to be connected with this idea in terms of how players may explore areas and how the rules of the game may prevent exploration and therefore

[39] Murray, *Hamlet on the Holodeck*. 133.
[40] Gilles Deleuze and Félix Guattari, *A Thousand Plateaus*. (London: Continuum, 1980), 7.
[41] Juul, *Half-Real: Video Games between Real Rules and Fictional Worlds*. 36.

multi-threaded narratives. Not all games contain narratives as shown by the often quoted line by Murray about *Tetris* being

> a perfect enactment of the overtasked lives of Americans in the 1990s – of the constant bombardment of tasks that demand our attention and that we must somehow fit into our overcrowded schedules and clear off our desks in order to make room for the next onslaught.[42]

This quote shows how narrative insights can be taken to the extreme when being applied to games. Yet to dismiss narrative in all games would not be beneficial, as the path of many games articulate narrative as well as ludic elements. If anything, Murray's discussions of the maze and labyrinth start to unravel the distinctions between these two terms and the need for clear definitions. One purpose of this thesis – and part of its contribution to knowledge – is to further define vocabularies that are still often intertwined, in particular those of mazes and paths.

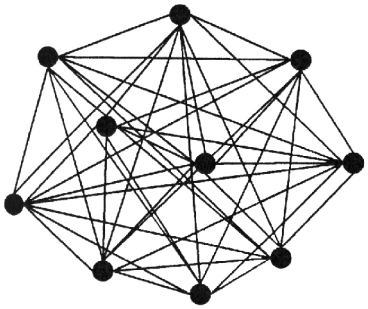

Figure 2.2 The complete graph
Ryan, *Narrative as Virtual Reality*. 246.

Marie-Laure Ryan again discusses various narrative structures in terms of nodes and paths to make comparisons about different narrative possibilities. She lists various models of "interactive narrativity" including "The complete graph, the network, the tree, the maze and the directed network."[43] Each node/path structure is highlighted in corresponding diagrams outlining each structures unique quality. In many ways, "the complete graph" (as depicted in Figure 3.2) can be linked to Murray's model of "the rhizome", where "every node is linked to every other node, and the reader has total freedom of navigation."[44] Each of these "interactive narrative structures" features paths describing how the user/reader explores the narrative.

[42] Murray, *Hamlet on the Holodeck*. 144.
[43] Marie-Laure Ryan, *Narrative as Virtual Reality*. (Baltimore: The John Hopkins University Press, 2001), 246.
[44] Ryan, *Narrative as Virtual Reality*. 246.

However, they are overall designs seen holistically and not on a path-by-path basis. Ryan sees the maze structure as a "characteristic of adventure games". This structure is discussed as having both one path from beginning to end, as well as multiple paths that may be explored between the start to the end point. It allows for the user/reader to move in circles and highlights characteristics of the maze such as the dead-end and "backtracking." Ryan also references Aarseth's concepts of "aporia and epiphany"[45], where aporia is seen by Ryan as a "dead-end" or a "puzzle to be overcome" and the epiphany is the "discovery, such as the solving of an enigma or the elimination of an opponent, that enables her to progress in her quest."[46] These qualities can be seen to correspond to those of the goal-driven, ruled systems of videogames, and seem to link to ludic concerns within the discussion of games, although here they are limited to narrative structures only. Although originating in literary studies, it is words such aporia and epiphany that will be reworked within this thesis to understand the players experience rather than the authored perspective. Ryan's diagrams explain narrative events through a primarily authorial position; yet do not always focus on how the player experiences each section of the narrative. However, these path structures do in many ways act as a starting point to understanding the maze in the videogame as more than narrative. The structures show what each individual branch can offer players within other graphically displayed videogames as opposed to the hypertexts and text adventures featured in Ryan's observations.

It is this generalisation of the maze or labyrinth as a designed experience that sees Aarseth too suggest how the maze is used in interactive, or what he classifies as "ergodic", texts. Writing in the late 1990s, Aarseth concentrates his work on the "Cybertext", discussing the rise of hypertexts, and interactive fictions, and crossing over into text adventures and earlier graphically displayed videogames. Aarseth calls these texts, "ergodic", a "term appropriated from physics that derives from the Greek words *ergon* and *hodos*, meaning 'work' and 'path'". "In ergodic literature, nontrivial effort is required to allow the reader to traverse the text."[47] This is one of the first mentions of the path within the discussion of media of this kind. Aarseth also differs from Murray and Ryan in that he is trying to break away from comparisons of literary work, in an attempt to re-categorise these interactive works as "ergodic" texts with new vocabularies. At the same time, Aarseth is still heavily reliant on literary terminology throughout his discussions. The links between the two are not severed,

[45] Aarseth, *Cybertext: Perspectives on Ergodic Literature*. 125.
[46] Ryan, *Narrative as Virtual Reality*. 251.
[47] Aarseth, *Cybertext: Perspectives on Ergodic Literature*. 6.

merely reworked in order to try and understand these emerging cybertexts in a new light and to reclassify older, paper-based written texts. As with Murray and Ryan, the labyrinth and maze metaphors are present within the early stages of Aarseth's work. Aarseth, unlike Murray and Ryan dismisses the "rhizome" or "net", stating that "to include the net seems inappropriate, since this structure has very different qualities from the other two"[48] (the labyrinth and the maze). Instead, Aarseth separates both the labyrinth and maze as two distinct terms being used to describe ergodic works. Unlike the two other authors, Aarseth begins to cite others who have looked at the meaning of the maze, in particular Penelope Doob. He recognises the histories of the maze, and how the terms maze and labyrinth were once used interchangeably, carrying the same meaning.

Through the work of Doob, an understanding of unicursal (single pathed) labyrinths and multicursal (multiple paths) mazes is developed. However, it is these terms that need further investigation. Understanding artefacts in terms of one having a singular path structure (the labyrinth) and the other having multiple, branching path structures (the maze), still tries to group instances of ergodic work into one of two categories. It is through this discussion of Aarseth, who focuses briefly on the work of Doob, that the research question of whether videogames rework our idea of the maze was posed. Although Aarseth cites the work of Doob, and notes how the Renaissance saw the newly dominant multicursal metaphor of the maze over-ride that of the unicursal labyrinth, there is sense of whether the ubiquitous nature of the maze metaphor and/or symbol in digital media has changed our understanding of the maze once again. Much like Ryan, Aarseth assumes a holistic approach, citing labels of path types, though he aims to rework literary theory and "challenge the recurrent practices of applying the theories of literary criticism to a new empirical field."[49] However, Aarseth too tends to group together too many media in his study. Although there are similarities between the navigation of the hypertext, text adventure and videogame, to compare all in the same light sees a vocabulary develop that does not specifically deal with the unique qualities of each media type.

As noted in the introduction, videogame studies branched away from discussions of other related media. This has seen the development of new theories relating to videogames such as how they are played, and the interactive possibilities they offer. One theme that has been developed over the last ten years is the concept of space within videogames. Theories in this

[48] Aarseth, *Cybertext: Perspectives on Ergodic Literature*. 6.
[49] Aarseth, *Cybertext: Perspectives on Ergodic Literature*. 14.

area have developed alongside the growth of videogame technologies. We have seen videogames emerge from being shown within the boundaries of one screen with two-dimensional graphics, to three-dimensional spaces, allowing players to explore not only left to right, but also *through* the screen, utilising the z-axis of three-dimensional space. As Aarseth states:

> the defining element in computer games is spatiality. Computer games are essentially concerned with spatial representation and negotiation, and therefore a classification of computer games can be based on how they represent – or perhaps, implement – space.[50]

This is a discussion reiterated by Murray, who writes:

> the computer's spatial quality is created by the interactive process of navigation. We know that we are in a particular location because when we enter a keyboard or mouse command the (text or graphic) screen display changes appropriately.[51]

Therefore the sense of "agency" associated with videogame media allows the player to move through space in a multitude of ways, and it is these issues that will now be discussed. The real world sees the path as a corollary of space, and it is through a discussion of the various theories of space within videogames that the path will be uncovered.

2.3 Videogame Space and the Screen

One discussion that bridges the gap between narrative and ludic constructs within the game world is that of space. Space has become the focus of analysis for those trying to understand the player's experience of their avatar moving through the gameworld. It is through a broader discussion of the theories of space, and how players are perceived to move through space in the gameworld, that the focus of this chapter will move to that of the maze, and in turn, the paths within videogames. In his book *The Medium of the Videogame*, Mark J.P. Wolf notes that space in videogames differs from other media due to the "added elements of navigation and interaction [that] lend an importance to diegetic space which is unlike that of other media."[52] He comments that game spaces are influenced by technical as well as aesthetic factors and that the player's view of the gameworld "determines how the game's diegetic

[50] Espen Aarseth, "Allegories of Space: The Question of Spatiality in Computer Games." In *Cybertext Yearbook 2000*, ed. Markku Eskelinen and Raine Koskimaa (Saarijarvi:Gummerus Printing, 2001), 152-171.
[51] Murray, *Hamlet on the Holodeck*. 80.
[52] Mark J. P. Wolf, *The Medium of the Videogame*. (Austin: University of Texas Press, 2001), 51.

world is constructed and represented on screen, and what it means."[53] Much of Wolf's discussion of spatiality in videogames is based on a comparison between the screen space of the videogame and the screen space of film. His viewing of space is often limited to what the player sees (or doesn't see) on screen and how this may (or may not) relate to off-screen events. Theorising space in this way places a heavy reliance on the avatar and the player's relationship with the avatar in terms of how much (or how little) of the game space they are able to see at any one moment. The avatar can be seen as the player represented onscreen. This is usually in the form of a depicted character that has the actions of the player translated onto it through an input device. Although the avatar is important within the discussion of screen space, the actual space of the videogame exists as more than the player's relationship to their onscreen representation.

Wolf's discussion leads to a categorisation of games in terms of how game space is constructed on screen, leading to the formation of categories ranging from "no visual space, all text based", through to "one screen, contained, with wraparound" and "scrolling on one axis" to "interactive three-dimensional environments" and "represented" or "mapped" spaces".[54] These categories encompass a wide range of games, from text adventures such as *Zork* (no visual space, all text based) to top-down arcade games such as *Pac-Man*[55] (one screen, contained, with wraparound), from side-scrolling games such as *Super Mario Brothers*[56] (scrolling on one axis) to 3-D First Person Shooters such as *Doom*[57] (interactive 3D environments). Although the space in each instance can be defined in terms of its representation, there is not necessarily a clear formula as to the type of game experience encountered by the player. For example, finding objects to open up further levels can be seen as a property of both side-scrolling games and first-person games. Although how the space is seen is altered in terms of perspective, many of the same rules and sequences of events can be translated across different screen-space representations. It is these events that are of interest in this thesis, suggesting why understanding space in terms of the path is key in trying to cover a wider range of represented spaces within game worlds.

[53] Wolf, *The Medium of the Videogame*. 51.
[54] Wolf, *The Medium of the Videogame*. 51.
[55] *Pac-Man* (Namco, 1980).
[56] *Super Mario Bros.* (Nintendo, 1985).
[57] *Doom* (iD Software, 1993).

In Wolf's comparison between the screen space of film and that of videogames he comments that

> rather than wait for the film camera to show it, off-screen space can often be actively investigated and explored by the player, and in some cases, like *Doom* (1993)…, and later mazelike games, it can constitute a large part of the game play itself.[58]

This discussion shows a distinction between film space and videogame space in that players do not always have to wait for the space to be revealed to them. Through input devices such as keyboards, mice, and game controllers, players can choose for their avatars to move in various directions as well as being able to pause and restart actions within the gamespace. The player is in control of where they go within the space, and in what sequence. Although barriers may prevent access to certain areas, often this is built into the game structure, or highlighted as in-game architecture with a definite boundary. Even though Wolf draws many comparisons between the screen of film and the screen of videogames, he does distinguish them as different media stating that

> the cinema offered a window and positioned the spectator within the world it depicted; the videogame goes further, allowing the spectator to explore that world through the surrogate of the player-character and take an active role in its events.[59]

It is through statements such as these that we can understand how videogames offer us the empowered experience of navigating our own individual paths. This differs from the journeys offered by film, which is determined by the film-maker and editor and can be seen as fixed tracks rather than paths that can be moved along and created by the viewer. Wolf is not the only author to discuss videogames through a comparison of other media, but what his analysis and categorisation shows is how the use of the term space is often too broad in trying to understand the player's relationship with the game world.

Therefore, one problem with how players understand space in videogames is that it is often discussed and constructed in a multitude of ways. Aarseth's essay entitled "Allegories of Space" focuses on the representations of space within videogames, in particular the differences between "closed" games (those following what he terms a more of a "labyrinth" type path) and "open" games (those which are seen to be more open to exploration on behalf of the player).[60] In discussing the game *Doom,* Aarseth writes:

[58] Wolf, *The Medium of the Videogame*. 51.
[59] Wolf, *The Medium of the Videogame*. 51.
[60] Aarseth, "Allegories of Space: The Question of Spatiality in Computer Games."

> Here the player-character is pitted against a series of monsters and mazes, with the object of getting through the labyrinth alive. Even in outdoors scenes in *Doom*, the landscape is riddled with obstacles and narrow paths. What may seem like a naturalistic world is in fact a constrictive topology of nodes and connections between them that interferes with unhindered movement.[61]

The focus of Aarseth's discussion shifts to how the architecture of the world and the aesthetic of the landscape may change throughout the game, yet the objectives and how to complete them still remain the focus of the player. In this instance, it could be said that both "open" and "closed" games can be linked through similarities in path structures, as most games experience boundaries of some sort through in-game geometry. It is these boundaries that can signify how much or how little the player is able to explore, and although linked to movement along the path, it is the path itself that is generated by the player in their attempts for exploration and understanding the game system. In order to understand the space of games further, there needs to be less emphasis on how the worlds are constructed through architecture, and instead how these "nodes and connections" work together to guide the player through the game. This is part of how movement through space is linked to both the rules of the game, and any story elements it may also supply the player. As Juul writes:

> space in games is a special case. The level design of a game world can present a fictional world and determine what players can and cannot do at the same time. In this way, space in games can work as a combination of rules and fiction.[62]

He goes on to emphasise the boundaries within games, especially "invisible boundaries" in games such as *Grand Theft Auto III*[63]. By progressing through the game and solving various tasks, the player is then able to open up these boundaries and explore more of the gameworld. The issue of boundaries in videogames is reinforced by Geoff King and Tanya Krzywinska who distinguish between "hard" and "soft" boundaries. "Hard boundaries" are stated as being "absolute restrictions in the gameplaying arena".[64] These include the use of water or blockades as used in some three-dimensional games that act as in-game scenery, creating boundaries that the player can never cross. Technological constraints force such hard boundaries within many games, as limitless worlds are not always possible. Soft boundaries, on the other hand, are those that act as temporary boundaries that require the player to find items such as keys, or complete a sequence of events in the correct order to open up these

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[61] Aarseth, "Allegories of Space: The Question of Spatiality in Computer Games."
[62] Juul, *Half-Real: Video Games between Real Rules and Fictional Worlds*. 163.
[63] *Grand Theft Auto III* (Rockstar Games, 2001).
[64] Geoff King and Tanya Krzywinska, *Tomb Raiders and Space Invaders: Videogame Forms and Contexts* (London: I.B. Tauris, 2006), 82.

boundaries. Soft boundaries help with the player's learning process as they are rewarded for opening up more parts of the gameworld. What is not discussed is how these soft boundaries open up more paths for the player, with the emphasis instead being on the broad use of the term space that is now opened up for the player's avatar to explore.

King and Krzywinska discuss how in many 3D action-adventure games or first-person shooter games, "a preset path is often combined with degrees of freedom to explore around the margins."[65] The discussion of paths here is limited to three-dimensional games. It is often the case that the addition of the z-axis has prompted a further discussion about exploration of game space than previous two-dimensional games could once offer. Understanding how it is possible to explore beyond what may seem to be the correct path of the videogame shows how players are offered chances to explore through the geometry of the gameworld. This is emphasised further during King and Krzywinska's discussion of the "blind alleys" found within games.[66] "Blind Alleys" may help the player gain extra lives or weaponry but do not exist as paths that lead to other parts of the gameworld. This distinction between "blind alleys" and what can be discussed as dead-ends of a maze is an issue to be pursued further through a discussion of vocabulary of the maze.

For now it is important to note how paths and spaces are often used as interchangeable terms, with the completion of a certain act along a path often leading to the opening up of a new space. The term space is often used in conjunction with what the physical screen space of the videogame offers players, therefore to distinguish between space, in-game architecture (or geometry) and paths as separate terms is an important focus of this thesis. It is recognised that game design is focused on how players interact with the spaces of the videogame. As Henry Jenkins and Mary Fuller state: "The art of game design comes in constructing a multitude of different ways we can interact with these visually remarkable spaces."[67] One way in which players do interact and indeed, move through gamespaces, is via the path. This next section starts by discussing the maze as a structure in videogames, and how it has been theorised so far.

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[65] King and Krzywinska, *Tomb Raiders and Space Invaders: Videogame Forms and Contexts*. 79.
[66] King and Krzywinska, *Tomb Raiders and Space Invaders: Videogame Forms and Contexts*. 79.
[67] Mary Fuller and Henry Jenkins, "Nintendo and New World Travel Writing: A Dialogue, in Jones", in *Cybersociety: Computer-Mediated Communication and Community*, ed. Steven G. Jones (Thousand Oaks.:Sage Publications, 1995), 57-72.

2.4 The Maze and Videogames

J.C. Herz states that "Arcade games tend to fall into structural subcategories like horizontal scrolling games…maze chase game."[68] These genres are then broken down or combined to produce "horizontally scrolling games with maze interludes."[69] The focus of the maze within the videogame appears to be concerned with discussions of the maze as one object containing various metaphors, or as a genre of videogames. Categorising the maze as a genre of videogame starts to raise questions as to how this genre can be defined. In Wolf's discussions of genre he states how the focus of genre is usually of "subject matter", rather than the "role of the audience".[70] Following on from using genre in literature and film, similar ways of categorising games have arisen with the use of terms such as "first-person shooter", "action-adventure", "platform" or "maze" games. Wolf attempts to re-categorise games by constructing a list of "interactive genres for classifying videogames."[71] This approach is used to signify player experience over game design. Among these 43 classifications of genre, there still exists the genre of "maze", discussed by Wolf as "what can be called a maze is, of course, a matter of degree, though it is usually possible to discern whether a configuration of rooms or hallways was intended to deliberately cause difficulties in navigation."[72] This categorisation once again appears to be too broad, and in his later comments, this genre is combined with other genres such as "flying", "shoot 'em up", "collecting", "escaping", "adventure" and so on, to cover a wide range of games. Here the maze is seen as an element of many game types and again seen as a whole entity rather than understanding what maze paths offer the player.

In their book *Understanding Video Games*, Simon Egenfeldt-Nielsen et al take the issue of genre in videogames further by stating that "genres, are arbitrary."[73] They propose four genres based on a "game's criteria for success" and what traits can be associated with succeeding in various game types. Their four genres are composed of "Action games", "Adventure games", "Strategy games" and "Process-orientated games."[74] By focusing game genres on game content in terms of gameplay and rewards, the emphasis is taken away from purely visual content and is instead focused on what the player actually does in order to move

[68] J. C. Herz, *Joystick Nation*. (London: Abacus, 1997), 25.
[69] Herz, *Joystick Nation*. 26
[70] Wolf, *The Medium of the Videogame*. 113.
[71] Wolf, *The Medium of the Videogame*. 116.
[72] Wolf, *The Medium of the Videogame*. 126-127.
[73] Simon Egenfeldt-Nielsen, Jonas H. Smith and Susana P. Tosca, *Understanding Video Games* (New York: Routledge, 2008), 41.
[74] Egenfeldt-Nielson, Smith and Tosca, *Understanding Video Games*. 41.

through the game space. This makes the maze as a genre of game redundant, as the focus is now on player experience as opposed to an overall design. The emphasis on "game as experience" also allows for the maze to be detailed as various different path types, and for the path to be understood as a feature of most (if not all) videogames. Understanding how the maze is often described in terms of genre starts to raise questions as to the player's relationship with the concept of the maze. The concept of the maze as genre is also important in analysing how other theorists and designers have previously discussed the maze, as well as noticing how theories of game genres have started to shift.

The association with the maze as a genre is also apparent in the work of game designers Rollings and Adams. They comment that "A maze is an area where every place looks alike, or mostly alike, and the player has to discover how the places are related to get out, usually by wandering around."[75] They see the maze as an obstacle to be overcome in a game, comparing it to other obstacles such as "locked doors" and "traps". It can be seen that a game labelled as a maze game brings with it certain expectations related to the metaphors associated with the maze, such as finding paths and feeling lost. Although mazes can be seen as fixed path structures with one start place and an end goal, the comparison between a maze as a puzzle and a "trap" does not appear to be a fair comparison. "Traps" are discussed as a "device that somehow harms the player's avatar when triggered…discouraging her from coming that way or using that move again."[76] Therefore "traps" or "doors" are elements that are more likely to be found along a maze path, rather than elements that can be compared to the maze itself. Although Rollings and Adams place the maze in the context of the text adventure where it is seen as a puzzle to overcome, to categorise the maze in this way raises questions as to how the maze is perceived by the player. It also rules out links between exploration and mazes through their definition of how a maze is used in game design. This raises a secondary research question, "Is it possible to have exploration whilst in a maze?"

In discussing the game *Adventure*[77], Warren Robinett starts to discuss the maze as a construct of different rooms with paths leading off them. He states, "A single room can show a simple maze on the screen, with passages going off the screen to other (as yet unseen) maze

[75] Rollings and Adams, *Andrew Rollings and Ernest Adams on Game Design*, 231.
[76] Rollings and Adams, *Andrew Rollings and Ernest Adams on Game Design*. 231.
[77] Warren Robinett, *Adventure*. (Atari, 1979).

rooms."[78] The maze is discussed as a walled area that stops players going outside of the boundaries of the walls. Much like the "maze as puzzle" scenario outlined by Rollings and Adams, once again the maze is seen as a bounded space, restricting the places players can explore. In text adventure games, the details of wall boundaries and the spatiality of the maze is important as the player relies on the text given to create their own mapping. As Robinett reiterates, "A maze is a geometric construction in space; the positioning of its walls defines a maze. Video graphics do an excellent job of capturing the geometry of a maze."[79] Robinett sees mazes as separate parts of the game as well as part of the game construction as a whole. Once again, there is an holistic approach to how the maze is viewed, yet the maze is now seen to have a different use to merely being a puzzle as previously described by Rollings and Adams. The maze provides boundaries, once again raising the question of exploration and the maze. The use of the maze within videogames actually helps aid exploration, by showing where the player can and cannot go. There is still an element of exploration in working out of these boundaries and connections. However, the issue of exploration and the maze does pose another question of "How do players play outside of the boundaries of the maze in videogames (both the boundaries of game rules and game geometry)?"

Robinett finally draws on connections between the maze and the direction of the path. He states that in some instances the path cannot be retraced. "This non-retracibility is a device the designer may use to construct a trickier, more confusing maze."[80] The direction of the path is also the concern of Laurie N. Taylor in her paper "Labyrinths, Mazes, Sandboxes, and the Garden as Game Space Metaphor."[81] Taylor states, "Games said to operate as mazes tend to follow more linear paths while the term sandbox is generally applied to more emergent games that allow for varied types of play and game progress."[82] Once again the maze is seen as restricting movement in its structuring, with this quote hinting that they do not promote exploration by the player. Taylor recognises the maze and labyrinth as metaphors that "refer to the paths taken through games", and introduces a further spatial metaphor of the "garden" as a way of "studying the diversity of game spaces". Again there is an emphasis on the

[78] Warren Robinett, "Adventure as a Video Game: Adventure for the Atari 2600." In *The Game Design Reader* , ed. Katie Salen and Eric Zimmerman (Massachusetts: MIT Press, 2006), 703.
[79] Robinett, "Adventure as a Video Game: Adventure for the Atari 2600." 703.
[80] Robinett, "Adventure as a Video Game: Adventure for the Atari 2600", 703.
[81] Laurie N. Taylor, "Labyrinths, Mazes, Gardens, and Sandboxes: Game Space Metaphors." In *GameSetandMatch II: On Computer Games, Advanced Geometries, and Digital Technologies* (Rotterdam, Netherlands: Episode Publishers, 2006).
[82] Taylor, "Labyrinths, Mazes, Gardens, and Sandboxes: Game Space Metaphors."

labyrinth or maze as an object in its entirety and these metaphors are not analysed further, therefore a new metaphor of the "garden" is placed on games that do not follow the "linear paths of the maze".[83] This can be seen as similar to the use of the "rhizome" as a way of explaining new types of path structures, as discussed previously. Taylor goes on to describe the labyrinth as unicursal in that it "guide(s) movement through a fixed path" whereas "mazes allow for choices and alternative paths".[84] As with Robinett, there is mention of unidirectional paths and the idea of the maze as a "fixed path". A detailed examination of the words labyrinth and maze is needed due to their use within the literature of hypertexts and videogames often leading to confusion as to what these two metaphors offer. This is particularly evident in Taylor's discussion of labyrinth vs. maze paths, as the labyrinth is seen as a single structure common to level-based games, allowing players to go from "one space to the next." Here the discussion centres on the space within videogames, as opposed to the paths with once again space being seen as a separate entity. As the maze has been discussed as a holistic structure, or a metaphor for singular or multiple paths, there has been little discussion about what else the maze offers players. The multiple paths of the maze are not all the same, and it is through a discussion of the different paths offered by the maze that a contribution to knowledge will be made through this thesis. Taylor instead focuses on spatial representation dealing with the space of the videogame as a designed element. Instead of viewing space in its entirety, this thesis aims to understand moving through game space on a path-by-path basis, rather than taking a completed, designer-led approach. In understanding games in this way, the emphasis is placed on the player, and how they experience these separate paths on a generative basis as they emerge through the exploration of the games "algorithm".[85]

2.5 Conclusion

In his book *The Language of New Media* Manovich states, "Movement through space allows the player to progress through the narrative, but it is also valuable in itself. It is a way for the player to explore the environment".[86] The player's experience of space is therefore not only influenced by how narratives may be perceived but is a learning process in itself. Instead of viewing game worlds as spaces, this thesis breaks down this idea of space into a more defined construct of the path. To understand the path helps to understand both narrative and ludic

[83] Taylor, "Labyrinths, Mazes, Gardens, and Sandboxes: Game Space Metaphors."
[84] Taylor, "Labyrinths, Mazes, Gardens, and Sandboxes: Game Space Metaphors."
[85] Manovich, *The Language of New Media*. 221.
[86] Manovich, *The Language of New Media*. 221.

elements as well as how these two areas may be combined. It also enables a discussion of goals and rules separate to any narrative the game may have, and how these rules and any goals within the gamesworld influence the nature of the path for the player.

What became clear within the review of literature on space and mazes within videogames, is that the maze itself is referenced for different reasons. It is seen as a multicursal path structure offering branching narratives, as a genre of videogames, or as part of other path structures existing as a puzzle to be solved in order to progress. The maze, however, is often seen as a metaphor for getting lost, confusing the player, and a puzzle to be overcome. These metaphors describe a wide range of purposes for games, and it is these that need exploring further. Every videogame is different, therefore it is also possible for varying maze-paths and structures to exist within them. This has been commented on by both Taylor and Fernández-Vara who, like Aarseth and Murray, comment on two types of maze structures, that of the unicursal maze and the multicursal maze. These authors are concerned with the labyrinth (unicursal) and maze (multicursal) as overriding metaphors. Games either fit into the category of the labyrinth, seen by Clara Fernández-Vara as "ways of directing and delaying navigation", or of mazes "as challenges to traverse."[87] Although videogames can be seen to encompass both categories within the same game, the multicursal path structure does not seem to be broken down further into its individual elements. As Taylor states, "Game worlds, as constructed spaces that lead player through particular paths, clearly rely on the metaphors of mazes and labyrinths."[88] Assuming the maze as a single entity also assumes a generalised metaphor for all game paths. Breaking down the maze into its individual components helps to understand the player experience of individual game paths, how they may relate to one another and how each maze design differs between games and even between multiple plays of the same game.

What these discussions do not query further is how the path structures within the maze are experienced in each scenario. A further investigation of mazes in videogames, and how this links to the player experience and understanding of the game world, comprises this thesis' contribution to knowledge. A common feature of both the videogame and the maze, the construct of the path is one element of the videogame that needs further investigation. The path, when mentioned, is not usually discussed beyond being a means of moving through space. It has yet to be clearly defined as to how it relates to the maze and other aspects of the

[87] See Fernández-Vara, "Labyrinth and Maze." 74.
[88] Taylor, "Labyrinths, Mazes, Gardens, and Sandboxes: Game Space Metaphors."

videogame. It is noted in the above discussion that videogames exist as a wide range of genres, and defining each genre has caused debate as to the most useful way to do so. The path itself bridges many genres of game, and therefore various games can be used to illustrate common features of paths. The maze needs to be examined in more detail as a way of understanding path structures in videogames, rather than trying to attach a new metaphor such as the rhizome to forms of interactive media. This thesis seeks to understand the maze further, in terms of its path structures and how the videogame may have reworked our cultural understanding of the maze. Investigating the paths of the maze further, it is possible to research paths that exist in both the real world and the virtual world of the videogame. A definition of paths and the methodologies used within this thesis will now be explored in more detail.

3. DEFINING VOCABULARIES & METHODS

3.1 Introduction

The literature review in the previous chapter showed that the term 'space' was often too broad in the discussion of how players move their avatars through the gameworld. Instead of concentrating on space within videogames, the focus of this research is on the *routes* through space. It is a definition of routes through space, both those found in the real world and those found within the videogame that constitutes this thesis' contribution to knowledge. Although paths are discussed by Aarseth, Murray and Ryan in relation to the maze, along with other spatial constructs, there are no clear definitions as to what a path is.[89] The paths of the maze are different to paths created in towns to connect buildings and places. This chapter defines terms related to different routes through space and provides clarity as to their uses within this thesis.

This research is concerned with the maze and its presence in the videogame, therefore to discuss the maze there first needs to be a definition of terms related to movement through space. This chapter outlines a vocabulary to be used throughout the thesis in relation to routes, paths, maze-paths and tracks. In order to understand the path in videogames, the worldly path itself is first discussed and defined. Understanding this helps to understand how the maze can be seen as a special type of route. It is through this understanding of a maze as a special type of route, that the maze is used to analyse the various path structures within videogames.

As well as defining a vocabulary of routes through space, this chapter outlines the types of videogames that were studied as part of this research. These are also separated in terms of path structures; those games that contain what I term direct paths and those that have displaced paths. By separating videogames into these categories, I am able to define the types of videogame that were studied and analysed as part of this thesis. This also allows for a comparison between worldly experiences of maze-paths and the types of path found in the virtual gameworld. In analysing various videogames in this way, it was important to understand not just the game, but also the player's experience of the game and the context within which the game is situated. As Frans Mäyrä states, the videogame can be studied by

[89] See previous chapter for theories of space. See the following for theories relating to the path, as previously discussed, Aarseth, *Cybertext: Perspectives on Ergodic Literature*, Ryan, *Narrative as Virtual Reality* and Murray, *Hamlet on the Holodeck.*

looking at the game, the player and contextual frames. He comments that, "these three spheres of inquiry cannot be separated, but must be seen both as mutually interacting and complementary, and informed by historical processes."[90] Whereas videogames may be discussed purely in terms of their design, the emphasis of this research lies in understanding the game, the played experience and the contexts within which the game is played. It is in this chapter that not only is a vocabulary of terms defined, but also a methodology for this research is stated and critiqued. This chapter starts by defining the various uses and constructions of routes in our everyday lives, moving from the paths of the real world and leading to a definition of virtual paths within videogames. This acts as a vocabulary to be used throughout this thesis in order for these terms to be understood.

3.2 Defining Routes from A to B

In moving across a landscape, walkers take various routes to get from one point to another. A route can be defined as a way of travelling from one place to another. The term route can then be broken down into various means of getting from point A to point B, each with their own definitions and corresponding uses.

Figure 3.1 Categories of routes

Figure 3.1 shows how routes can be broken down into paths, maze-paths or tracks. Each route type has its own definition and set of properties. A path can be defined as a route between point A and point B. Georg Simmel states,

> The people who first built a path between two places performed one of the greatest human achievements…it was only in visibly impressing the path into the surface of the earth that the places were objectively connected.[91]

[90] Frans Mäyrä, *An Introduction to Game Studies: Games in Culture*. (London: Sage Publishing, 2008), 2.
[91] Georg Simmel, "Bridge and Door", in *Rethinking Architecture: A Reader in Cultural Theory*, ed. Neil Leach (Abingdon: Routledge, 1997).

The route taken along the path is bi-directional, meaning that the walker is able to walk back and forth along the path; they are not limited to going in one direction only. Paths can then be broken down into further categories as shown in Figure 3.2.

There are various scenarios for walking a path from point A to point B. It may be that the walker knows what is at point B, and has a clear idea of how to get there. It may be that the walker knows what is at point B, but takes various routes (through C, D, E, etc) and gets lost on the way before arriving there. It may be that point B is not known by the walker, but found by their wandering. This act of wandering may continue (through points X, Y, Z, etc), but will more than likely end in a destination of point B. This category of path relates to walkers who create their own paths through wandering, and exploring the landscape. Alternatively, paths can be prescribed in that they are clearly marked out in the form of concrete pathways or ruts of trampled soil across fields. Paths may also be a form of ritual, in that these paths are walked in particular ways as determined by an outside agency. Therefore paths can be broken down into the three categories shown in Figure 3.2:

1. Paths determined by the walker.
2. Prescribed paths.
3. Ritual paths.

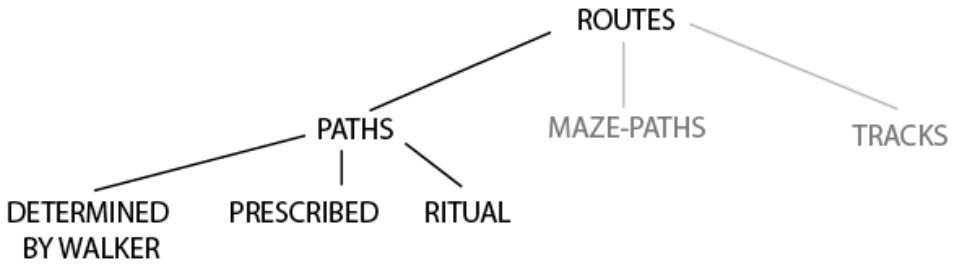

Figure 3.2 Categories of paths

Paths determined by the walker can be seen through the acts of wandering, which can be seen as one purpose of walking. It is through walking that we have a relationship with the path and the places along it. Although different types of route can be travelled using cars, bikes and airplanes, it is in the act of walking the path that we have a one on one relationship with it. In writing about the act of walking, Rebecca Solnit notes, "The path is an extension of walking…Thus the walking body can be traced in the places it has made."[92] Our pace along

[92] Rebecca Solnit, *Wanderlust*. (London: Verso Books, 2006), 29.

the path is limited to our own speed in terms of how fast or slow we want to or can walk. Other vehicles increase this speed and therefore can significantly alter our understanding of the path and the relationship we have with it. It can be seen that vehicles reconstruct time by being able to speed up and slow down movement along a path. Therefore, vehicles remove a person's direct relationship with the path. As Solnit states, "Walking should be called movement, not travel, for one can travel around the world immobilized in a seat, and a certain kind of wanderlust can only be assuaged by the acts of the body itself, not the motion of the car, boat, or plane."[93] Vehicles may also restrict the ability to pause our movement due to rules and regulations placed on roads, such as no stopping zones or having minimum speed-limits on some roadways. Paths can become marked through concrete walkways, signalling where the walker should or should not walk reducing the freedom to wander, yet the walker is still able to pause along these paths unlike when travelling in a vehicle.

The path created by the walker through the act of wandering can eventually become a fixed structure on the landscape. It is these paths that are prescribed or generated for us, such as the paved walkways we use to get from A to B. Prescribed paths can also appear through the worn away routes chosen as shortcuts, going between other paths already fixed in concrete. This is shown by the worn away grass in Figure 3.3. Pathways have become more and more fixed, and designed, with the growth of towns and cities. The importance of the prescribed path has been recognised through its design in city planning. Kevin Lynch analysed various city structures, including that of the path. He interviewed a number of people, questioning what they thought to be the most common "city elements".[94] The path came out as the most "predominant" but it was noted that its "importance varied according to the degree of familiarity with the city."[95] These paths were often thought about in terms of what street they comprised and how they combined with other "landmarks" such as the buildings placed along them. In this sense it was the architecture along the path that defined the memory of the street name, or other buildings in relation to the street, not the path of the actual street itself. Whereas Lynch is concerned with the identity of the path and what this meant in terms of the architectural structuring of the city, this thesis is concerned about the various paths that routes are constructed of and the experiences of the walker/player along them.

[93] Solnit, *Wanderlust.* 6.
[94] Kevin Lynch, *The Image of the City* (Massachusetts: MIT Press, 1960), 49.
[95] Lynch, *The Image of the City*. 69.

The constructed nature of the prescribed path, as permanently marked out in the landscape, can come with its own sets of rules. Prescribed paths may be marked out with signs, such as one side for cyclists, another side for pedestrians, showing the walker which side it is safe to walk on. Figure 3.4 shows how the pavement is marked for pedestrians and cyclists. Although there may not be any fixed boundaries, other than a white line, it is common practice to adhere to these signs, especially if they are used as a warning as to the path's uses. Signs next to the path such as 'keep off the grass', may also dictate that the route of a certain path is to be used, and the walker is in no way supposed to stray from it. It is possible, however, for a prescribed path to become a place of wander; to turn into a path determined by the walker. In a thick covering of snow, once concrete paths have become hidden, the walker is free to choose the way. If a path becomes known, it may be that the walker chooses to keep to the same route that once lay beneath the snow. It is also possible for walkers to create their own path, perhaps a more direct route in order to get to their destination. This is similar to the shortcuts that get worn into constantly trampled grass, the newly prescribed paths, that can lead walkers from point A to point B more easily.

Figure 3.3 Path worn into the grass

It is possible for the experience of the prescribed path to be different for many people, with the same path holding various meanings. Walking a path time and time again, may for some, be an act of ritual, and in walking the same path different meanings may start to unfold. Ritual paths can be constructed from prescribed paths but they have different uses and meanings. Although prescribed paths show the walker the way they can go, the ritual path takes this further, by determining the way the walker should go, and the ways in which they

should perform or behave. How to walk a ritual path is decided by groups of people, for the walker to then follow the ritual, such as pilgrimages walked each year. Although the ritual path is prescribed and determined by other influences outside of the walker, the walker is not forced in one direction along the path. They still have the ability to pause and reflect somewhere along the path, and have their own meanings and experiences associated with each separate walking.

Figure 3.4 Bike and pedestrian signs on pavement

3.3 Mazes as Special Types of Route

The maze can be seen as a special type of route, as it has all the properties of the different types of path already discussed. Instead of having one or two uses as demonstrated by the other path types, the maze can have multiple uses and meanings even though its fixed pattern remains the same. The maze can be an extension of the prescribed path, with a deliberately authored pattern, yet offering many uses and meanings for the walker. It is possible for mazes to be places of wander, with walkers ignoring the paths of the maze and walking over them. Mazes can also be seen as ritual paths with the act of walking the maze determined by an outside agency. However, the maze differs from the other types of path, as although it can share their properties, the maze is constructed of a deliberately authored pattern. Although mazes are prescribed in the landscape, they have different uses to the prescribed paths that take people between different buildings and towns. Mazes can be broken down into two path types, that of the unicursal maze-path and that of the multicursal maze-path. Figure 3.5 shows the new categories of maze-paths and how they are broken down. Unicursal maze-paths have one route from start to finish, whereas multicursal maze-paths see the walker faced with a

series of choices (some taken, some omitted, some repeated) in determining a route from beginning to end.

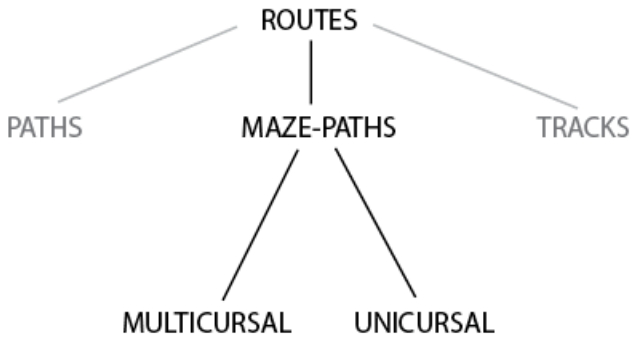

Figure 3.5 Categories of maze paths

The unicursal maze-path is one that has one route from beginning to end. This can be seen in Figure 3.6 that depicts the labyrinth plan of Chartres cathedral with its one route from beginning to end. It is for this reason that the unicursal maze-path is different from other paths previously discussed. The unicursal maze-path through this definition has multiple uses compared to a prescribed path that is deliberately created to connect towns or buildings. In creating labyrinth and maze paths for other uses from that of pilgrimage to a place of play, the labyrinth/maze can be seen as a special type of route and therefore separated from other path types.

Figure 3.6 Unicursal labyrinth
Chartres Cathedral Labyrinth

The walker of the unicursal maze-path is still able to move freely forwards and backwards along it as they please. One of the labyrinth's many uses is for it to be walked as an act of pilgrimage, in the same way other paths can be walked through ritual. Whereas ritual paths may use prescribed paths along their route, unicursal maze-paths are created as contained areas on the landscape and may have the act of ritual as one of their uses. The ritual walking of the labyrinth has been decided by an outside agency, determining the rules surrounding the walk. These influences can be how fast the walker should be going, how to walk the path, and/or what to think about whilst walking the path. To *not* walk the labyrinth in this way breaks the meaning of the ritual. As Solnit states, "To walk the same way is to reiterate something deep, to move through the same space the same way is a means of becoming the same person, thinking the same thoughts."[96] This is not to say that the labyrinth can not be walked in other ways. It is possible to walk a labyrinth starting at what some may perceive to be the end point (the point in the inner section of the labyrinth) and walk to the end (or what others believe to be the beginning). It is also possible to walk across the paths of the labyrinth and create a new path determined by the walker, separate to the markings made on the ground. Once again, this type of maze-path can have different uses and meanings depending on the walker and their individual journey along or around it.

The multicursal paths of the maze however, differ from unicursal maze-paths. Multicursal maze-paths offer the walker choices and decision-making through their branching paths from the beginning to the end goal. Although the unicursal maze-path can offer choices in its meanings, the multicursal maze-path forces choices through its design. It can also be seen that both the unicursal and multicursal maze structure amplify the characteristics of the path through their design. Although the paths are created and contain certain qualities, the walker is still free to move back and forth along the paths as they so choose and are not forced in one direction. This once again sees maze-paths being linked with the idea of prescribed paths. However, the route through the maze can be seen as distinct to the paths that are prescribed to allow walkers to get from point A to point B. Maze-paths require concentration on behalf of the walker. They have been, and still are, referred to in terms of ritual walking, but they also offer other experiences for the walker. Multicursal maze-paths in particular offer a unique experience to each walker as they negotiate their way from start to finish. Therefore the experience can differ on each walking of the same maze, although the pathed boundaries remain the same. The boundaries of the pre-determined maze-paths create various decisions for the walker. It is this trait that has meant people now refer to an unfamiliar built

[96] Solnit, *Wanderlust.* 68.

environment, such as city structures, as a maze of buildings or streets. Although the maze can be seen as a place of confusion, the maze metaphor also implies order and a potential understanding of the place and its routes. Once faced with a maze structure, the emphasis of the walker then shifts to how to solve the maze. The act of wandering becomes obsolete as we try to navigate to our destination surrounded by obstacles of buildings, roads, traffic lights, trees and various other boundaries restricting our movement between points A and B. Mazes create a mapping and separate path finding experience for the walker. The wanderer, on the other hand, creates their own mapping in the formation of their own paths. The bounded paths of the maze can create other path structures and experiences within their structured nature, therefore offering both structured and more freeform paths depending on the needs of the walker. Understanding the maze as a set of special paths allows it to be discussed beyond previous metaphors attached to the maze as one type of design. Separating the maze from other path experiences also shows how the maze has been used for and understood as various purposes. Both unicursal and multicursal maze designs have been constructed for various different reasons. It is through their deliberate designs that maze-paths differ to the paths constructed to function as walkways between buildings, and link people between towns and various other landmarks. The maze also adds further metaphors to the notion of the path, such as a sense of being lost and offering confusion Discussions of unicursal maze-paths allow for distinctions to be made between these paths and the final type of route found in the categories outlined in Figure 3.1; that of the track.

3.4 Tracks

The use of the word track in this thesis can be seen in reference to the tracks of railway lines or tramways – fixed, determined structures created by someone else in order to determine a journey. It may be seen that the unicursal maze-path with it's single route from beginning to end is a fixed path, but only tracks exist as permanently fixed routes. It is the experience of tracks that separates them from other types of routes through space. Tracks can be seen as the opposite of paths. Whereas a path allows for free flowing movement and can be described as being bi-directional, the track restricts movement in one direction, making them unidirectional (not to be confused with unicursal). Tracks can be discussed through the scenic railways of the late 1800s and early 1900s. as documented by Brenda J. Brown.[97] She writes, "The visual landscape of rides…and later scenic railways were, like their prototype,

[97]For the histories of scenic railways and theme parks see, Brenda J. Brown, "Landscapes of Theme Park Rides: Media, Mode, Messages", in *Theme Park Landscapes: Antecedents and Variations* , ed. Terence Young and Robert Riley (Washington D.C: Dumberton Oaks Research Library and Collection, 2002).

amalgamations of landscape fragments – scenic, often exotic, and conducive to kinaesthetic excitement."[98] These railways pre-dated amusement parks and rollercoasters, but their sensory and narrative elements created an experience similar to that found in many amusement parks today. There is no provision for pausing or stopping the ride; these acts can only be carried out in negotiation with the person controlling the movement along the track. This can be likened to the pilgrimage along the path, where the rules of how the path should be experienced are externalised by an outside source and relayed to the walker. In both cases, although the path/track has been pre-determined by someone else, it is still possible for the walker/user to have their own experience along it. This can be seen by narrative rides, as offered by Disneyland, that control the sequence of narrative events. Scott Bukatman discusses the attraction of narrative rides, commenting that,

> The topics of these rides are intensely narrative as well; Peter Pan's Flight recapitulates the entire narrative of the film, encounters with giant plastic sea creature in 20, 000 Leagues under the Sea are narrated by an ersatz James Mason, and the famed Jungle Cruise provides a human guide pretending to steer the vessel…[99]

Bukatman goes on to reiterate how even the rollercoaster "whose raison d'etre is purely kinetic sensation, is narrativized in the Magic Kingdom."[100] Both narrative rides and rollercoasters are able to hold more than one user. The user may be cut off from others in terms of having their own seat, or in 3D rides with the use of glasses, but essentially the rides are created for all users to have the same narrative experience. Putting the ride on tracks in this case ensures that the attention of the users is focused on the same narrative in an authored sequence. The tracks are essential in maintaining this consistency due to the expense of creating and maintaining such rides. Defining routes through space sees a clear distinction between that of the path and the track, where the track becomes fixed by outside sources separate to the user experiencing the path. In order to complete the discussion of path definitions, it can also be seen that videogames themselves offer paths separate to those outlined above. It is through the following discussion of these types of path that the games to be studied as part of this thesis will be defined.

3.5 Defining Videogame Paths

The paths of the real world can be discussed from a phenomenological perspective, as articulated by cultural geographer Christopher Tilley who states that, "phenomenology

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[98] Brown, "Landscapes of Theme Park Rides: Media, Mode, Messages."
[99] Scott Bukatman, *Matters of Gravity* (London: Duke University Press, 2003), 17.
[100] Bukatman, *Matters of Gravity.* 17.

involves the understanding and description of things as they are experienced by a subject. It is about the relationship between Being and Being-in-the-world."[101] The walker of the path has a sense of being, and being along the path. However, the paths of the videogame lie beyond the screen, and it is through a sense of "agency"[102] that the player sees the actions of controlling an avatar on screen. Although the avatar itself will not be the focus of this thesis, it is an important factor in determining the games that will be discussed in case studies throughout this research. It is not possible to dismiss the avatar completely as to do so would be to ignore the experience of the player along the path, since it is through the avatar that the player seeks and achieves interaction; a feedback response that what they are controlling is affecting the world around them. As King and Krzywinka discuss, "A player-character, by definition, acts as the player's on-screen embodiment in the gamescape."[103] It is therefore this displaced embodiment that is believed in by the player as they move their avatar along the paths of the game. The interest here is not with avatarial:spatial constructs, or issues of how the player relates to their avatar on screen in terms of representation, gender, and so on. Instead, it is in the player and the movement of their avatar along the path.

As noted in the previous discussion of worldly paths, the walker on the path has a one-to-one relationship with the path, and it is on this relationship that I wish to focus throughout this thesis. In order to understand this one-to-one relationship, I have split games into two categories; those containing direct paths and those containing displaced paths. Direct paths within videogames offer a direct relationship with the path, something found in first-person games. As noted by King and Krzywinska:

> the most distanced games tend to be those that use god-like aerial perspectives. The greatest sense of presence, or immersion in the gamescape, is usually provided by games that offer the first-person perspective of a figure located within the fictional world of the game.[104]

It is within these games that the player has the view of either 'inside' the character (as in first-person games) or linked to the avatar (as in third-person games). God-games place the player at a position above the avatar or team of characters in the gameworld, therefore distancing the player's viewpoint from the path.[105] It is these games that have what I term displaced paths. Displaced paths enable the player to move around and above the gamespace

[101] Christopher Tilley, *A Phenomenology of Landscape* (Oxford: Berg Publishers, 1994), 12.
[102] See Murray, *Hamlet on the Holodeck*. 110.
[103] Geoff King and Tanya Krzywinska, *Tomb Raiders and Space Invaders: Videogame Forms and Contexts* (London: I.B. Tauris, 2006), 98.
[104] King and Krzywinska, "Gamescapes: Exploration and Virtual Presence in Game-Worlds."
[105] See games such as, *The Sims* (EA, 2000) and *Black and White* (EA, 2001).

rather than through it. These paths also allow the player to control the gameworld from a distance and can be seen in team-based games, such as football simulations.[106]

Videogames with direct paths have viewpoints on the same/similar level as the avatar in the game, and there can be seen to be a greater connection between the player and the path the avatar moves along in the gameworld. Although side-scrolling games such as *Super Mario Bros.*[107] may appear to have a path beyond the gameworld, the actions of the player controlling the Mario avatar are immediately translated into the avatar moving across the screen. This differs from games with displaced paths where the player may control a team of characters, or a separate avatar linked to a team. It is in games such as these that moving the character may not occur at the same time as pressing buttons on a keyboard or controller. It is this sense of "agency" or displaced embodiment associated with videogames with direct paths that can be seen in Ryan's discussions of narrative in digital media. Ryan states there are four modes of interactivity, grouped as "internal/external" and "exploratory/ontological".

> In the internal mode, the user projects himself as a member of the fictional world, whether by identifying with an avatar, or by apprehending the virtual world from a first person perspective. In the external mode, the reader situates himself outside the virtual world. He either plays the role of a god who controls the fictional world above, or he conceptualizes his activity as navigating a database.[108]

Ryan's second categorical subset, that of "exploratory/ontological", relates how the user has an impact on the virtual world they are experiencing. The exploratory mode is seen as one where the user is free to explore, yet there is no change in the paths of the world, whereas the ontological mode is focused on the decisions of the user, therefore changing the different paths that can open up to them. I would contend that within the videogame, the paths of the game are constantly changing even through an exploration of the system. However, Ryan's categories of "internal/external" do help to categorise the types of games that will be the focus of this study. In understanding the player's relation to the path, it is the direct ("internal") paths of the game that will be the focus of discussion. In Ryan's terms, outlined above, this means the analysis of games that are viewed from a first-person or third-person perspective. These games can also be discussed through Aarseth's categories of "indoor" and "outdoor" games where he states,

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[106] See games such as *Pro Evolution Soccer* (Konami, 2001).
[107] *Super Mario Bros.* (Nintendo, 1985).
[108] Marie-Laure Ryan, "Beyond Myth and Metaphor: The Case of Narrative in Digital Media" *Game Studies* 1, no. 1 (2001).

> Another possible distinction can be made between two different spatial representations: the open landscapes found mostly in 'simulation-orientated' games, and the closed labyrinths found in the adventure and action games. We might call this the 'indoor' vs. the 'outdoors' distinction between games that use doors to control movement vs games that do not.[109]

Although Aarseth's "indoor" games relate to spatiality, the genres of games he uses to distinguish between "indoor" and "outdoor" games link to the idea of direct and displaced paths. Simulation games tend to contain displaced paths as the player is generally distanced from the gameworld, yet action and adventure games generally contain direct paths due to the player being linked to the actions of the avatar along the paths through the gameworld. Unlike Ryan and Aarseth's categories, direct paths and displaced paths are not categories related to freedoms of exploration in the gameworld. Both direct and displaced paths allow for exploration of the gamespace, but the gameworld can be explored differently through each category. Whereas displaced paths may allow for an overview of the gameworld and an exploration of the whole landscape, the exploration of direct paths may occur on a path-by-path or level-by-level basis as the gameworld is gradually revealed to the player.

Figure 3.7 Tom Clancy's *Ghost Recon Advanced Warfigher 2* Co-op split screen mode
Tom Clancy's Ghost Recon Advanced Warfigher 2 (Ubisoft, 2007)

Direct paths are not only associated with single player games. Games such as *Tom Clancy's Ghost Recon Warfighter 2* and *Lego Indiana Jones* allow for more than one player on the path. Figure 3.7 shows a split screen perspective offered in *Tom Clancy's Ghost Recon Warfighter 2*. Here players can work together but have their own viewpoint on either the top of the bottom half of the split screen. Figure 3.8 shows *Lego Indiana Jones* where both players are shown on one screen as they work together. Although each player can explore

[109] Aarseth, "Allegories of Space: The Question of Spatiality in Computer Games."

separate areas, they are both exploring similar paths. Each player still has a direct relationship with the path they are on through their own avatar. However, it is the concept of time in videogames that is important in separating direct paths of videogames and displaced paths of videogames and is developed in the methodologies used within this research.

Figure 3.8 *Lego Indiana Jones* – two players on one screen
Lego Indiana Jones (Traveller's Tales, LucasArts, 2008)

3.6 Defining a Methodology

Understanding the paths of the real world and those found within the videogame is central to this thesis. The main methods used within this thesis are those of walking real world maze paths, and playing videogames in order to draw comparisons of path types. The category of direct paths within videogames was drawn up to highlight those games analysed in comparison to worldly mazes. However, this is open to interpretation, as the experience of walking the real world path cannot be mapped directly on to that of moving an avatar along a path in a videogame. Therefore this section highlights the problems and issues related to the methods used, and the theories that are drawn from more recent videogame studies as a way of bridging the gap between these two spatial paradigms.

Explorations of the role of phenomenology and videogames have so far drawn upon theories of representation, realism and the presence of the player through the avatar within the virtual gamespace.[110] The role of phenomenology is often linked to "immersive and first-person"

[110] See Patrick Poulin's comments on the role of Phenomenology in video game studies in Patrick Poulin, "Phenomenology." In *The Video Game Theory Reader 2*, ed. Bernard Perron and Mark J. P. Wolf (New York: Routledge, 2009), 372-373, and Geoff King and Tanya Krzywinska, *Tomb Raiders and Space Invaders: Videogame Forms and Contexts* (London: I.B. Tauris, 2006), 97-123.

games, yet there is still a debate as to how real world actions are translated into or onto those happening on the screen.[111] Hannah Sommerseth discusses phenomenology in terms of the player's body in relation to realism within videogames stating that "An alternative approach [to discussing realism in games] would be to consider the player, or more precisely the player's embodied perception, as where the experience of reality is ultimately located."[112] Whereas Sommerseth notes that it is not possible to translate the whole body into the virtual realm, she argues there is a connection between bodily acts within the real world and their connection to the actions occurring within the gamespace. Walking the paths of the real world can also be seen as a phenomenological activity.[113] However, real world walking involves the movement of muscles and limbs that cannot be translated into the virtual world space. To move the avatar in the videogame in many cases only requires small hand or arm movements by the real world player rather than the full body motions of physical walking. Therefore, it can be seen that there is a displaced embodiment. The act of walking in the real world relies on whole body actions, therefore the translated actions of thumb presses and limited arm movements only allow for movement in the game world to be a representation of the kind of movement that occurs within the physical realm. This differs from the phenomenological sense of embodiment that King and Krywinska state occurs within the gameworld. They discuss '*being-in-the-gameworld*, a phenomenological impression of presence in the gamescape."[114] However, it is important to note there is still a discontinuity between full physical movement in real world spaces and movement through an avatar in a virtual world. Whereas in the real world we can see walking as a practice that allows us to exist within the space in which the action activity is occurring, this cannot be directly translated to the virtual video game experience. Therefore the physical activity of the body is displaced through the screen, and translated into a representation within the virtual gamespace. Whilst there is not a direct correspondence between our real world bodies, and those that appear within the gamespace, the triggering of actions from hand and arm movements cause the virtual character to move within the videogame.

This research is concerned with walking the real world maze in order to understand path structures within videogames. Although comparisons are made between different path types,

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[111] Poulin, "Phenomenology." 372-373.
[112] Hannah Sommerseth, "'Gamic Realism': Player, Perception and Action in Video Game Play" (paper presented at Situated Play, DiGRA Tokyo, Japan, 2007).
[113] This is evident in Tilley's comments about phenomenology and landscape as cited on page 46. See Tilley, *A Phenomenology of Landscape*. 12.
[114] Geoff King and Tanya Krzywinska, *Tomb Raiders and Space Invaders: Videogame Forms and Contexts* (London: I.B. Tauris, 2006), 98.

the initial act of walking real world maze spaces was not to produce a direct mapping between walking and avatarial movement in the game world. The experience of walking the real world maze provided a position from which to observe the features of the videogame maze. It allowed for a distancing from the actions occurring within the gameworld that were often familiar and therefore went unnoticed. Walking the real world maze was a new experience. The spaces were unfamiliar and therefore allowed for a heightened awareness of the paths I was walking and how the each maze was structured. Each maze also appears within a fixed point on the landscape, unlike the ever-growing paths of the videogame, therefore each path was in many ways contained. This allowed for the maze to be examined through this process of walking and provided a vocabulary of experiences that led to a contemplation and reflection of how these maze paths were also present in many ways within the videogame space. It was through this reflection that a morphology was constructed as a way of separating maze paths into different types and understanding the flow between the paths in the construction of the maze.

The focus of the research is on the paths within the game space, and how these may have evolved and changed our understanding of the maze. Therefore the purpose of the walking was not as an experience to be directly mapped against how spaces are moved through in the videogame, but as a way of reflecting and understanding how these real world spaces may have changed. It did, however, raise issues of the avatar, and how it may be possible to compare real world and virtual world maze experiences. Through the act of producing a morphology of maze paths as a way of understanding different path types within videogames, it became clear that these paths would not necessarily exist within every genre of videogame. At this stage, the position of the avatar within the videogame and the way in which it is moved by the player along the game path became a way of separating the types of games that were studied within this thesis.

The avatar within the videogame can be seen as a control device to highlight the player's actions. I have previously discussed the "four main characteristics of avatars. These are:

> 1. Locus – it's place in its world and how that is communicated to the user/player.
> 2. Agency - the ability to effect an action in its world.
> 3. Empathy – how much the player/user relates to and/or cares about what they are affecting in the world.
> 4. Player Character – who am I within the world? What can I do? What do I represent?"[115]

[115] Alison Gazzard, "The Avatar and The Player: Understanding the Relationship Beyond the Screen" (Paper presented at VSGames09, Coventry, UK, 2009). Available online at: http://www.computer.org/portal/web/csdl/doi/10.1109/VS-GAMES.2009.11

It is the component of the "locus", the avatar's place within the gameworld, which is important to this thesis in the methodology it applies. The movement of the avatar occurs through the use of a game controller, a keyboard and/or a mouse input device. The actions of various movements or button presses of the input device see a feedback loop occur between the actions of the player's controls and the movement of their onscreen character. In games with direct paths, there is an instant relationship between the player input and the onscreen character action. There is, of course, a slight delay between pressing the button and the avatar moving, but there is a constant feedback loop between where the player positions the avatar and the position of the avatar as displayed to the player. The player controls the "locus" of the avatar in a direct path game. In games with displaced paths, the "locus" of the avatar is determined by the game's software as the player positions some start and/or end points to the avatar, but the game's system controls where the avatar goes in between these points.[116] In the case of games with displaced paths, the "locus" of the avatar is not player dependant.

Whereas Sommerseth has stated that phenomenology can be used as a way of understanding the extension of the controller, through Heidegger's notion of the "ready-to-hand"[117], it is not possible to map this experience as one directly related to real world movement along a path. Therefore, instead of using the avatar as a total extension of the player in order compare the paths of the real world to those found within the game, the concept of time is used as a way of bridging these ideas. Time is categorised by Juul in terms of "play time'", which "denotes the time span taken to play a game", in contrast to "fictional time", described as, "the time of the events in the game world".[118] These conventions are accepted by players given the tropes of novels, dramas, and films, in which constructs of time are frequently restructured through these mythic, fictional worlds. Juul discusses how simulation games such as *The Sims*[119], offer time in the gameworld that is separate to the time passing within the real world. This is shown by Juul's diagram in Figure 3.9 that shows how two minutes of "play time" can equate to one year of "fictional time".

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[116] See games such as *Civilization Revolution* (Firaxis, 2K Games, 2008), *The Sims* (Electronic Arts, 2000), *Black and White* (Lionhead Studios, EA, 2001).
[117] Sommerseth states that "In relation to the gaming experience, the notion of the active body can be made clearer id we consider the joypad as an object in the light of Heidegger's notion of the ready-to-hand…" See Hannah Sommerseth, "'Gamic Realism': Player, Perception and Action in Video Game Play."
[118] Juul, *Half-Real: Video Games between Real Rules and Fictional Worlds*. 142.
[119] *The Sims*.

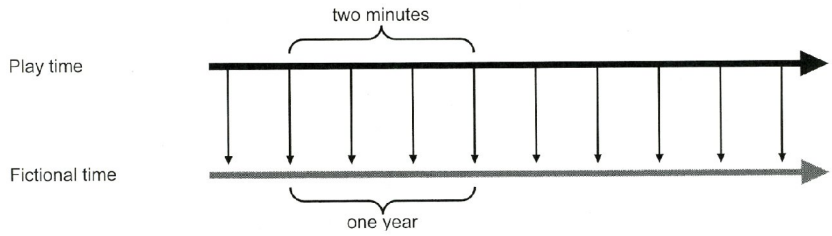

Figure 3.9 A fictional time of a year takes a few minutes to play.
Juul, *Half-Real: Video Games between Real Rules and Fictional Worlds*, 142.

It is in these games that fictional time is offset by play time. The player can experience the time in the gameworld changing rapidly, where days in the fictional world of the game can pass in mere hours of the players "play time" in the real world. In these cases the player does not have a direct relationship with the path, as the path is generated on a separate time scale to that of "play time". Games such as these usually consist of tasks which involve the player managing or looking over various objectives, all within the same gameworld. It can be seen that these actions take place along displaced paths rather than directly inside the gamespace. The research within this thesis is primarily concerned with games that offer a one-to-one relationship in terms of "play time" to "fictional time", as shown by Juul's diagram in Figure 3.10. By using this mapping of time, it is possible to compare the same mapping of time as experienced in walking the paths of the real world. The walker of the real world path is able to walk along the path in direct relationship to it, whilst time is passing. The player of the videogame is able to experience a similar relationship as the controller's actions move the avatar along the path(s) of the gameworld.

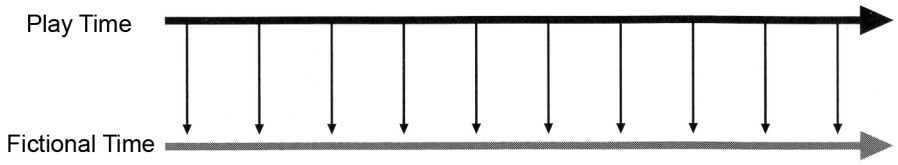

Figure 3.10 Real-time games: The play time has a 1:1 projection to the game world's fictional time.
Juul, *Half-Real: Video Games between Real Rules and Fictional Worlds*, 142.

It may be the case that in-game features such as cut-scenes, intro sequences and warp devices alter this one-to-one mapping, but these instances will be highlighted as and when they arise within the research. For now it can be seen that this one-to-one mapping is typically displayed in games played from a first-person or third-person perspective, which are those containing direct paths. Therefore videogames chosen to be included in this thesis can be seen as various sub-genres of these games, such as first-person shooters (FPS), puzzle games,

action-adventures, platform games, side-scrolling games, text adventures and various arcade games. Although camera positions can be changed in third person games, or games may be side-scrolling such as in *Super Mario Bros*, or top-down such as in *Pac-Man*, the focus of the player's attention is on their avatar, its location on the immediate path, and the obstacles it has to overcome on that path.

Therefore, the main methodology used within this research is based around Juul's model of "play time" and "fictional time". However, in order to understand how videogames have reworked our understanding of the maze, the uses of mazes throughout history also had to be studied. By understanding the various uses of labyrinth and maze structures within the real world, it was then possible to see how their uses may have changed within the videogame. Alongside walking real world mazes, a study of mazes throughout history was also briefly conducted as a way of understanding how the maze as a structure may have changed through its ubiquity in the videogame. Undertaking a historical study is not without its limitations, as mazes and labyrinths were not always documented for their uses when they are mentioned throughout history. Research undertaken by maze scholars such as Penelope Doob and Herman Kern have been used as secondary sources.[120] Whereas walking the maze can be a phenomenological process, it is noted that exploring some of the uses and histories of the maze as one of the methods used within this research can often be interpreted differently depending on the perspective of the author. Therefore any reference to historical uses of mazes and labyrinths within the following chapters of this research will be placed in context in terms of the author and the position of their research on the subject.

3.7 Conclusion

By understanding the routes walkers take through the real world, it can now be seen how these different routes and their uses will be used in the discussion of videogames. Although the experience of the walker and the player is different, these ideas of routes, particularly those of unicursal and multicursal maze-paths, have been used frequently in discussions of the videogame. This chapter has defined a vocabulary of terms that will be used throughout the rest of this thesis, as well as constructing a methodology for why real world maze paths

[120] Penelope Doob conducted research on labyrinths and mazes from the ancient to the mediaeval period, looking at their uses and references within literature. See, Penelope Doob, *The Idea of the Labyrinth from Classical Antiquity through the Middle Ages* (Ithaca: Cornell University Press, 1990). Hermann Kern produced a collection of images from labyrinths and mazes throughout history with a written commentary. See Herman Kern, *Through the Labyrinth: Designs and Meanings Over 5000 Years* (Munich: Prestel, 2000).

were walked, and how this links to the types of games that are to be analysed further within the research.

Focusing on the one-to-one relationship between the player's avatar and the path allows us to understand the player's experience of maze-like paths within the videogame. How the player negotiates these paths is key to the discussions of this thesis. Much like how Baudelaire focused on the flâneur as the subject of the Parisian Arcades, the videogame player is the focus of the relationship between the player and the path of the videogame.[121] Manovich draws on this comparison between Baudelaire's flâneur and the user/player moving through virtual space, stating that "Like Baudelaire's flâneur, the virtual flâneur is happiest on the move, clicking from one object to another, traversing room after room, level after level, data volume after data volume".[122] Instead of strolling the arcades, the virtual flâneur is moving through representations derived from reams of data. Instead of encountering the boundaries of walls and buildings, the virtual flâneur is encountering the boundaries of technology. It is through these bounded paths of the maze that the player learns and develops an understanding of the game space. Now that the paths of the maze have been categorised in relation to other uses of the path, this thesis now turns its attention to the histories of the maze, and the questioning of whether videogames rework our cultural understanding of it.

[121] For discussions of Baudelaire's flâneur see, Walter Benjamin, *The Writer of Modern Life: Essays on Charles Baudelaire*. (Cambridge: The Belknap Press of Harvard University Press, 2006).
[122]Manovich, *The Language of New Media*. 247.

4. DO VIDEOGAMES REWORK OUR IDEA OF THE MAZE?

4.1 Introduction

> Unlike a Platonic idea, the kind of idea I'm talking about is not 'true', universal, or immutable; like other human ideas, the idea of the labyrinth is subject to temporal change, the most marked change occurring in postmediaeval times, when the presence of false turnings and repeated choice become the labyrinth's dominant characteristic.[123]

In the literature review it became clear that the links between maze paths and the paths of the videogame are strong, but how have earlier labyrinths and mazes shaped our experience of the videogame maze? Is it possible to say that the videogame has reworked our cultural understanding of the maze? It is these questions that will be explored in more depth within this chapter. There is recognition of the maze as a narrative structure and videogame design feature, and authors such as Taylor and Fernández-Vara recognise the difference between labyrinth and maze structures in videogames.[124] Yet there is little or no discussion about how videogames have changed our cultural relationship with the symbol and act of walking the maze. This chapter explores some of the uses of the maze and labyrinth in history. It also details some of the labyrinths and mazes I have walked as part of this research in order to understand their uses today.

Some of what resides in this chapter is an extension of the work of Penelope Doob. Her work *The Idea of the Labyrinth from Classical Antiquity through the Middle Ages* looks at the maze/labyrinth symbol as both design and experience through the literary work of such authors as Pliny, Ovid and Virgil.[125] Espen Aarseth, Jacques Attali and Hermann Kern then notice a shift in the Renaissance as to how the maze structure changed from being seen as a single path structure to a multiple path structure.[126] It is this notable shift during the Renaissance that will then be discussed in relation to the videogame maze-like paths in an attempt to forward this discussion once again.

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[123] Doob, *The Idea of the Labyrinth from Classical Antiquity through the Middle Ages.*
[124]See Taylor, "Labyrinths, Mazes, Gardens, and Sandboxes: Game Space Metaphors" and Fernández-Vara, "Labyrinth and Maze."
[125] Doob, *The Idea of the Labyrinth from Classical Antiquity through the Middle Ages.*
[126] See Aarseth, Cybertext, Jacques Attali, *The Labyrinth in Culture and Society*. (California: North Atlantic Books, 1996) and Hermann Kern, *Through the Labyrinth: Designs and Meanings Over 5000 Years.*

This investigation of maze paths started with the walking of the Italianate Maze at Capel Manor, Enfield, UK. Walking this maze was my first experience of the maze in the real world, and was documented as an experience prior to investigating the history of such mazes. This first experience led to feelings of confusion and frustration at being surrounded by hedge boundaries and having no understanding as to where I was within the maze. However after being in the maze for a while, my understanding of the directions and paths I had already walked started to become heightened. It was from this first walking that other maze paths were then visited, and these will be commented on throughout this chapter in relation to the history of labyrinths and maze paths, and their evolution into the worlds and spaces of the videogame. Charting the development of the labyrinth and maze throughout history will always lead to speculation as to their uses and meanings due to a lack of documentation about the experience of the maze as opposed to its design. The maze has been a symbol within our culture for as long as we have been able to document it, but these documents are not always accurate and people's perceptions of mazes are very rarely captured. It is this factor in particular, the *experience* of the maze, that relies on guesswork and other events in history to provide possible answers to the change, development and use of the maze over time.

In the beginning of this discussion the words maze and labyrinth may be used interchangeably, as Doob notes,

> Both models are based on the concept of the path, the journey from beginning to end; both imply a sequence of movements or perceptions, usually designed intentionally as a sequence, and both may involve choice, although the nature, implications and prominence of that choice vary greatly.[127]

It will be through a historical and cultural discussion of the development of these two terms that will then see them separated and it is then that the distinctions between the two terms will be noted as and when needed.

4.2 Mazes in the Beginning

Although the roots of labyrinth/maze design can never be certain, one such myth that depicts the labyrinth/maze symbol is that of Theseus and the Minotaur, and it is this that will be used as a starting point in the discussion of these symbols. Versions of the myth differ slightly from each telling but the main elements are as follows; the labyrinth, as constructed by the architect Daedulus, was built to hold the Minotaur (a half man, half bull creature) to keep the ferocious beast away from King Minos. It is then told that each year, seven boys and seven

[127] Doob, *The Idea of the Labyrinth from Classical Antiquity through the Middle Ages*. 25.

girls (this number changes in different versions) were sent from Athens as sacrifices to feed to the Minotaur creature so that Minos no longer battled with the mainland. It is during one of these sacrifices that Theseus is sent to Crete in order to be thrown into the labyrinth to be killed by the Minotaur. Ariadne, King Minos' daughter, fell in love with Theseus and decided to help him by providing Theseus with a ball of string to navigate out of the labyrinth and a sword to defeat the Minotaur.

However, this story in itself causes a great deal of debate. How can a labyrinth, seen by the post-modern mind as a unicursal path, with one path from beginning to end, be a place of confusion and threat? And, if indeed it was a unicursal labyrinth then why did Theseus need a ball of string to find his way out if there were no misleading paths and dead-ends? This starting point of the maze/labyrinth discussion shows how the words labyrinth and maze were once used interchangeably within the ancient world, both carrying the same connotations of being lost and having multiple paths, therefore offering no confusion for the listener/reader of the story.

What the myth of the Minotaur and the labyrinth does offer is one explanation related to where the word labyrinth came from. The site of Knossos, Crete, is often seen as the site of the mythical Minotaur labyrinth, yet there has been no architectural discovery that offers an exact match to the labyrinthine paths as depicted in the myth. However, Doob notes that Knossos was, "profusely decorated with meander patterns and double axes (the labyrs) related to the Minoan bull cult".[128] The origins of the word labyrinth, has been linked to "labyrs" or double axe, as found in various decorations at the site of Knossos.[129] Hermann Kern collected and studied images of mazes and labyrinths throughout history. He states that, "The figurative, proverbial sense of the word [labyrinth] has been in use since later antiquity (third century CE) and can be traced back to the concept of a maze, a tortuous structure (a building or garden) that offers the walker many paths, some of which lead to dead ends or blind alleys".[130] Kern discusses the histories of the term labyrinth as residing within vocabularies since around the third century CE, and it is here that the word is primarily

[128] Doob, *The Idea of the Labyrinth from Classical Antiquity through the Middle Ages.* 25.
[129] For details of the origins of 'labyrs' see David Willis McCullough, *The Unending Mystery: A Journey through Labyrinths and Mazes* (New York: Random House, 2005), 36, and W.H. Matthews, W.H., *Mazes and Labyrinths their History and Development* (New York: Dover Publications, 1970), 34.
[130] Kern, *Through the Labyrinth: Designs and Meanings Over 5000 Years.* 23.

"employed as a literary motif".[131] The links between the site of Knossos and the Greek myth of the Minotaur has given historians cause to believe that the word "labyrs" is a starting point for the evolution of the idea of the labyrinth. In similar ways, the word "Troy" is often used as a name for turf labyrinths in England and Europe, with again authors such as Doob and Matthews stating that this word use may be linked to the word "truia". "Truia" is a word found inscribed on Etruscan wine-pitchers showing a labyrinth symbol in amongst depicted imagery of men on horseback.

> This was very roughly decorated with incised figures, representing amongst other things a circular labyrinth of the traditional type and some horsemen who are thought to be engaged either in the attack on Troy or in the game known as the Lusus Troiae or Game of Troy.[132]

It is believed that the horsemen are taking part in an act described as the "lusus" or "ludus Troiae". The "ludus Troiae" is described as a ritual where the men on horseback dance, and create similar patterns to that of labyrinthine paths. Also referred to as the "Roman Game of Troy" this, "labyrinthine Trojan Ride, served to commemorate two occasions: the founding (i.e. birth) or a city and burial ceremonies".[133] In Kern's opening interpretations of the labyrinth, he focuses on the labyrinth as being a place of initiation, especially through the act of dancing the "Trojan Ride" that was stated as being performed at the founding of a city.[134] Kern believes the paths of this labyrinthine dance were pre-marked on the ground beforehand due to the complexity of such a dance.

My first experience of a labyrinth was that of the turf maze at Saffron Walden, Essex, UK. As Figure 4.1 shows this is not the depicted representation that we nowadays come to associate with how mazes are structured. A labyrinth can be seen as a unicursal structure, meaning a singular path from start to end. Mazes on the other hand are multicursal structures, in that they consist of one route through a choice of paths and false turns in order for the walker to reach their goal. Understanding this distinction is important in understanding the labyrinth symbol. Although termed a turf maze, the image shown of Saffron Walden does in fact depict a labyrinth. There is one path folding in and out forming various patterns, taking the walker near the goal, and away from the goal, but all the while having only one path that arrives at the goal.

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[131] Kern, *Through the Labyrinth: Designs and Meanings Over 5000 Years.* 23.
[132] Matthews, *Mazes and Labyrinths their History and Development.* 52.
[133] Kern, *Through the Labyrinth: Designs and Meanings Over 5000 Years.* 30.
[134] Kern, *Through the Labyrinth: Designs and Meanings Over 5000 Years.* 30.

Although there are different types of labyrinth patterns, all labyrinth designs offer one path from start to finish but do so in differing patterns. What is termed to be the Cretan style of labyrinth is shown on the Etruscan wine-pitcher alongside the representation of men on horseback. This unicursal path structure was also discovered in Roman mosaics such as those shown in Figure 4.2 found at Thuburdo-Majus, Tunisia dating from A.D.372.

Figure 4.1 Saffron Walden Turf Maze

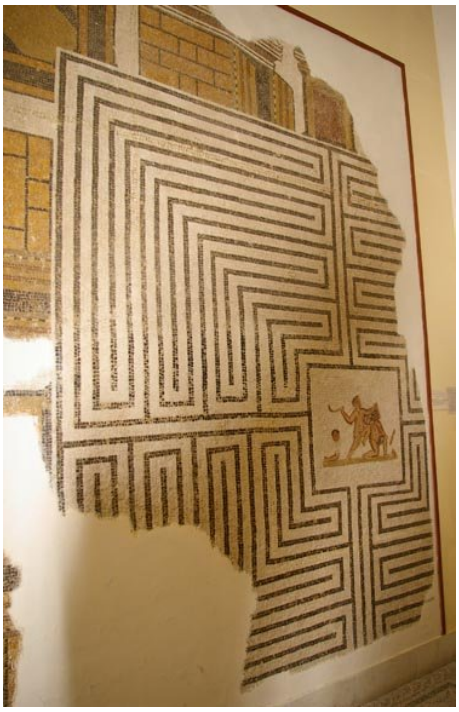

Figure 4.2 Labyrinth mosaic, Thurburdo-Majus, Tunisia, A.D.372

Although unicursal paths were found in mosaic designs and pottery, the labyrinth was often discussed as a multicursal idea. Jacques Attali writes about the Egyptian labyrinths, constructed in the form of extensive tombs:

> Entirely artificial in construction, they are designed to confuse anyone who does not know their pattern. These reveal one of the primary functions of the labyrinth, which is akin to that of the pyramids: preventing access by strangers to tombs of royalty, and keeping the secret of this voyage so that none can come to make off with the objects therein.[135]

These winding corridors with interconnecting rooms were termed labyrinths, yet contained multiple paths to confuse the walker and make the paths harder to navigate. Therefore, although both unicursal and multicursal ideas were depicted and discussed, the ancient mind did not appear to require the use of two distinct terms to separate these experiences.

4.3 Understanding the Maze in Literature

Doob focuses on the idea of maze and labyrinth structures as written about by such authors as Ovid, Virgil and Pliny. Understanding the purpose of these authors' writings about the maze/labyrinth symbol starts to unfold the different uses of how these symbols were discussed. The interests of these three authors allows us to see how the maze can be viewed in two distinct ways as both design and experience, which becomes important in order to understand the maze in the videogame.

Through her investigations, Doob notes that Pliny was interested in the design of the labyrinth and its status as a piece of architecture. Ovid, however, was interested purely in the myth of the labyrinth, whereas Virgil was "…fascinated with story *and* structure, the path through the maze as well as its elaborate pattern".[136] Although Doob is concerned with the history of the use of the term 'maze', it is through the writings of the Ovid, Virgil and Pliny that her emphasis shifts to how the metaphors and meanings of the maze start to be decoded. This is distinct from purely historical accounts of the existence of the maze in ancient times. As Kern also notes, it is through the ancient mind that the labyrinth is seen as a "literary motif", and it is during the Renaissance that the shift in depictions of the maze start to change.[137] It is through Doob's unpacking of the interests of Ovid, Virgil and Pliny that we can start to understand how the maze can be interpreted as a piece of artistry, as architecture and as a symbol to be both admired and/or feared. This is contrasted with the experience of

[135] Attali, *The Labyrinth in Culture and Society*. 5.
[136] Doob, *The Idea of the Labyrinth from Classical Antiquity through the Middle Ages*. 18.
[137] Kern, *Through the Labyrinth: Designs and Meanings Over 5000 Years*. 167.

the labyrinth, the paths of which it is constructed, how people walk those paths and the experiences the paths may offer them. Many of Doob's statements about the maze are about what the maze as a symbol and a place of experience meant to those documenting and writing about the maze. There were times when the word maze and labyrinth were used jointly to connote the same thing, yet there appears to be a shift in the thinking about the maze around the time of the Renaissance, which is noted by Kern and Attali. Aarseth also comments that

> Where the unicursal paradigm faded, however, the multicursal paradigm came to dominate the figure, developing the rich ambiguity of the classical and medieval labyrinth into the less ambiguous Renaissance model of pure multicursality.[138]

4.4 Separating the Labyrinth and the Maze

Splitting the maze into two forms, of the unicursal labyrinth and the multicursal maze, Doob starts to draw on comparisons between the differences that the singular and multiple path structures can offer us. To understand these differences further, I have outlined Doob's main distinctions of these terms in Figure 4.3.[139]

Unicursal	Multicursal
Confusion from inherent disorientation	Confusion from repeated need for choice
Frustration is directed onwards the structure and its architect	Frustration is directed towards ones' own incapacities
Individual responsibility diminishes	Wanderer and his own errors are responsible for this fate
Enforce passive dependence on the maze-maker who has already plotted the path: wanderer must submit completely to the structure	Wanderer actively determines his course (although his choices are usually limited by fixed alternatives)
Maze-walker is Everyman not an individual	Exemplifies the constant choice demanded of an individual
One learns by precept[140]	One learns by dialectic[141]

Figure 4.3 Separating ideas of unicursal and multicursal structures

[138] Aarseth, *Cybertext: Perspectives on Ergodic Literature*. 7.
[139] See Doob for her original discussion, Doob, *The Idea of the Labyrinth from Classical Antiquity through the Middle Ages*. 50.
[140] Doob, *The Idea of the Labyrinth from Classical Antiquity through the Middle Ages*. 57.
[141] Doob, *The Idea of the Labyrinth from Classical Antiquity through the Middle Ages*. 57.

This shift in understanding labyrinths and mazes as separate objects and experiences shows how, although they were once seen as similar objects, they do in fact offer different experiences for the walker and even the observer. Doob notes how characteristics such as the responsibility of the walker shift from walking the labyrinth to walking the maze. Within the multicursal maze structure the emphasis is now placed on the walker finding their way through the paths, rather than being led by one design. The submission of the seemingly more passive walker to the labyrinthine paths as opposed to the active walker of the multicursal maze could be understood as the labyrinth offering an ontological experience, over the more existential experience of the maze. The labyrinth is about being on the path, submitting to the structure of the path, and walking a similar route to those who have previously tread the path. In comparison, the maze raises the issue of the walker existing within the different types of path of the maze, by making decisions, and in Doob's eyes creating a unique experience for the walker.

The separation of the terms labyrinth and maze into their own unique meanings during the Renaissance will now be explored to try and understand why these two words became so distinctive. In many ways the shift from unicursal depictions of labyrinths to multicursal mazes may be linked to ideas of how people organised their thoughts about the city structures that were emerging around them. Some of the Roman labyrinth mosaics discussed previously were depicted as being contained within walls with turrets on each of the four bounded walls surrounding the labyrinth design. It could be that the image of the labyrinth was a way of depicting the cities emerging at the time of the creation of the mosaics; a way for people in the ancient world to start to represent the maze-like streets emerging around them. Containing the labyrinth inside city walls within the design of the mosaic could suggest how the artist and owner of the maze were trying to understand these emergent cities as mapped representations of what they were now seeing.

This idea of trying to understand the shifting culture occurring within the Renaissance could then be linked to the development of walled multicursal maze structures. Walled hedge mazes differed from the turf labyrinths, and the tiled labyrinths of church and cathedral floors found throughout Europe. The walls now created a definite boundary between paths and as Tilley states, "boundaries are to do with creating distinctions and marking out social oppositions, mapping social and cultural difference and otherness".[142] The structures of the

[142] Tilley, *A Phenomenology of Landscape*. 17.

walled maze were found in the grounds of stately homes, serving purposes such as play spaces, or as a way of showing wealth, status and education. The hedge maze demanded a noticeable position within the garden, which in turn required a generous amount of land that functioned purely for the design and experience of the maze. This meant these types of mazes were now experienced by fewer people, compared to the more social turf labyrinths once found on the village green to be used by the whole community. Hedge mazes required a purposeful visit, if the walker did not have access to one on their own land. Not only did the walls create boundaries, but also the paths contained within the walls now offered the walker a choice as to how to reach the goal of the maze. The path was no longer mapped out in front of them, and the walker had to experience getting lost, making decisions and the more playful element of walking through these new designs. This shift from the known path to that of the more discoverable path, highlights how the Renaissance was a time of change. It is associated with people exploring new previously undiscovered countries, creating maps and having access to this new type of information. There was no longer the sense of the unknown as previously associated with the city streets and how they once continued to grow. As Attali states,

> the city slowly became less and less labyrinthine…Maps and signs carefully named all the streets…For the literate, the labyrinth no longer existed…From Renaissance times on, city maps were drawn to scale and sold.[143]

It could be said that the Renaissance maze now provided entertainment by turning these once feared paths into something new, and changing the way the path was now viewed. Instead of the paths of the city being a place to be feared, they had now become ordered through the use of maps. Therefore the maze could be seen as a place to create a new sense of disorder in amongst the ordered paths of the real world streets. Hedge mazes, with their multiple paths and added mystery, through dead-ends and decision-making could now replicate the feeling of being lost once again. They also became places of play for those that could experience them.

> Certainly geometrical gardens, many in labyrinthine patterns, flourished in Italy, France, and England during the Renaissance. These too changed the way the labyrinth was viewed and experienced, for they encouraged the playful soul to see the maze as a place for fun and game.[144]

This is not the first time the maze or labyrinth has been seen as a place of play. The church labyrinth was also seen as a place of play for children during some of the sermons much to

[143] Attali, *The Labyrinth in Culture and Society*. 58.
[144] Matthews, *Mazes and Labyrinths their History and Development*. 216.

the annoyance of the canons. This caused some church labyrinths, such as one in Reims, France, to be destroyed as it was seen as a distraction.

> As early as 1311, the Council of Vienna forbade dances and games in church labyrinths; apparently this was not so effective, for they had to be prohibited again two years later, in a decree of the Parliament of Paris of 1538.[145]

The dancing of the labyrinth paths also occurred as a planned form of ritual amongst the canons at the church of Auxerre from 1396 until 1538 each Easter Sunday.[146] A leather ball (called a pilota) was thrown back and forth amongst the canons whilst dancing along the paths of the labyrinth on the church floor. Therefore, labyrinth paths contained within churches had various uses other than that of ritual walks, which are frequently associated with them. People often seek out the unicursal paths as places of small pilgrimages, such as the labyrinth at Chartres, which is now uncovered each Friday so that people can walk the path. Walking the path is often seen as an act of reflection, due to the walker's required concentration. Whilst visiting the labyrinth at Chartres, I walked the labyrinth as well as observing others walking the same path. On reaching the cathedral just before 9am, a few people had already gathered waiting for the final chairs to be removed from the labyrinth. Once removed, people started to walk the labyrinth from beginning to end, with the first walker setting the pace of each subsequent person's walk. It was difficult to tell if this was for a particular reason, or if the people that followed remained the same pace out of a politeness and fear of ruining that person's walk. Many people paused at certain points amongst the paths, defined through their personal choice. The majority of people walked head down, hands clasped as if in thoughtful prayer making their way along the paths. Once at the centre of the labyrinth, people generally paused for a while, standing in one of the rose shapes, allowing at least 8 people to comfortably stand at once. This is shown in Figure 4.4. Some people then moved out of the labyrinth, no longer obeying the paths, whilst others started to walk the paths backwards, from the centre out to the exit. This proved interesting to watch and experience as it often confused people walking (what is perceived to be) the correct way from start to centre. It caused the walkers to briefly question as to whether they were on the right path or had missed a path. Even the unicursal labyrinth, with it's links to ritual and rules of the one path can cause confusion for some walkers from time to time, especially when they experience the unexpected, such as someone walking the wrong way round the paths.

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[145] Attali, *The Labyrinth in Culture and Society*. 36.
[146] Craig Wright, *The Maze and the Warrior* (Cambridge, Massachusetts: Harvard University Press, 2001), 140.

Figure 4.4 Labyrinth at Chartres Cathedral, France

This contrasts with the experiences I have witnessed at the turf labyrinths at both Saffron Walden, UK, and the *Mizmaze* turf labyrinth at St Catherine's Hill, Winchester, UK. The turf maze at Saffron Walden is out on the common, as opposed to the *Mizmaze* at St Catherine's Hill being out of the town, and sought by a deliberate walk up a hill to experience. Although these labyrinths are similar, neither place has seemed to attract people seeking a definite outcome in walking them. Both places are visited by walkers and observers of the general landscape, with the *Mizmaze* in particular appearing to be a common picnic ground and place of play for children with their parents. It is here that I have witnessed children playing on the paths of the labyrinth, running on them, or on the turf between them, devising their own rules, such as who can reach the centre the quickest, or racing on one particular path from start to finish. I have never witnessed anyone else walk the entirety of the labyrinth at Saffron Walden, other than myself and friends, but again, I have seen it used as a social place. Groups of people from the town use it as a place to meet and sit at the centre of the labyrinth. Matthews notes the uses of the turf maze in the eighteenth century stating that,

> In a manuscript book of the latter part of the eighteenth century the maze is spoken of as a favourite resort for the young bloods of the town, a complicated systems of rules and wagers (in gallons of beer) being laid down in connection with walking the maze.[147]

In more recent times I have seen children play with their parents, sitting near the labyrinth and inventing worlds for the paths whilst they used toys to mark out which were the paths of

[147] Matthews, *Mazes and Labyrinths their History and Development*. 84.

the land and which were imaginary water paths running next to them that the toys were not allowed on. Perhaps due to these labyrinths being out in the open, on openly accessed commons near towns, they have a more social use nowadays. This contrasts to the ritual walking experienced at Chartres where walking the labyrinth appeared to have a spiritual value for many, due to it's location in a place of worship and the links with labyrinths being seen as pilgrimages. As Kern notes, "Accounts of labyrinths being used as paths of repentance, as a substitute for pilgrimages to the Holy Land, and as surfaces around which to dance pertain exclusively to this type"[148], that of the church labyrinth, the single path to salvation.

As with the unicursal labyrinth, garden mazes have also been documented as having multiple uses such as places of play or purely for relaxation. Glendurgan Maze in Cornwall exists on the side of a small valley, surrounded by exotic gardens and trees, as shown in Figure 4.5. Due to its location, it is a small sanctuary in amongst its surroundings, and could easily be seen as a place of escape. This laurel maze dates from 1833, and alongside being a place of play, the maze was documented as having other uses. A memoir from the gardens notes, "Elizabeth Tuckett in her diary of 1854 wrote: 'we dined in the house and then lay on the grass and sand until we joined the gentlemen who had retired to the labyrinth to smoke'".[149] On having a maze at their disposal, the people of the house probably used the maze as any other part of the garden, a place for relaxation. In solving the maze a few times, the novelty may have worn off for the participants, therefore other uses started to take shape within the walls and paths of the hedge maze. Doob reiterates this use of mazes:

> Entertaining place of dalliance, conversation, and exercise, hedge-mazes presumably served many of the same functions as any other garden while intensifying the normal garden's formal artistry, and adding an element of challenge.[150]

The structure of the maze probably gave the gardens a sense of mystery, expense and wealth to those that were outsiders to the house and its occupants. Yet for those living in the house and constantly surrounded by the gardens, the maze becomes yet another part of the garden and everyday use sees it lose its mystery. It is through the maze becoming commonplace and everyday to those inhabitants that we can start to see how the ubiquitous nature of the videogame starts to see our relationship with the maze change once again.

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[148] Kern, *Through the Labyrinth: Designs and Meanings Over 5000 Years.* 143.
[149] Charles Fox, *Glendurgan: A Personal Memoir of a Garden in Cornwall*. (Penzance, Cornwall: Alison Hodge, 2004), 46.
[150] Doob, *The Idea of the Labyrinth from Classical Antiquity through the Middle Ages.* 111.

Figure 4.5 Glendurgan Maze, Cornwall, UK

4.5 The Maze in Videogames

Just as the meaning of the maze changed from the ancient to the modern – and again in the Renaissance period – the maze in the post-modern digital era has once again undergone a cultural shift. The development of technology, in particular that of the videogame, has enabled the maze as a symbol and as a way of moving through (and thinking about) spaces, to be more accessible than ever before. Videogames and hypertexts have allowed people to create their own maze-like paths through various narratives and virtual architecture.

What the maze symbol in videogames initially shares with more traditional labyrinth structures is the space that both structures take up on the screen or land respectively. Both mazes and labyrinths enable a long path to exist in a relatively smaller space on the floor. This is particularly evident at the turf maze of Saffron Walden as although it is 35 metres in diameter, the path of the maze is 1500 metres long. Early game mazes took also advantage of the lack of screen space to produce apparently larger paths of play. Although restricted to one screen without any side level scrolling, *Pac-Man* gives the player hours of game play by enabling the avatar to be guided through the various paths collecting power-pills before the ghosts reach it and the avatar dies. The maze exists as a top-down 2D representation showing the player the boundaries of the paths on screen. This concept of extending space also exists through the use of maze-like paths within three-dimensional videogames. The use of corridors offering maze-like paths, through early 3D games such as *Doom*, helped to confuse

and lose the player in their environment.[151] This act of using the maze as a way of delaying the action makes virtual spaces appear larger than the technology allows, through prolonging the players experience in the act of exploring and figuring out the puzzle.

The virtual paths of the videogame can also be separated from the worldly maze through their generative nature and the videogame path's emergence through the player experience. Each path is generated as it is experienced, and what occurs along each path influences the player being able to experience other paths. This in turn may also shape the experience along other paths to be encountered. These paths open up further paths and obstacles to be overcome. In writing about the generative nature of the game, Wolf states:

> Except for when they play video clips, computer displays and videogame also differ from both film and video in that they do not have a linear series of pre-recorded images to display on-screen; the computer displays the current image in its screen buffer repeatedly until changes occur due to the program's algorithm or input of the user.[152]

For now, it can be said that videogame mazes appear to have two main functions:

1. Having multiple fixed paths restricting movement, yet making the space appear larger.
2. Allowing for generative or emergent paths, leading to differentiation with each play.

Pac-Man can be seen as a key example of how fixed and generative mazes exist in one game. The walls/boundaries of *Pac-Man* are fixed. The player cannot change them, and they act as a map, outlining on screen where the player can and can't go. Within the fixed maze walls, the pills reinforce the structure of the path in the game, guiding the player along the routes she can follow by collecting them. Collecting the pills changes the movement along the bounded paths, and creates further maze like routes, other than the mapped out maze boundaries. These pills add another dimension to the game. It is these that are the emergent maze of the game, within the fixed, bounded walls. The pills can be collected in any order, collected and disappearing whilst the player is battling the arrival of the ghosts that seek to end the game. The pills, ghosts and power-pills work together to form maze structured paths, creating dead-ends, changing the direction of Pac-Man, and changing the end point of the goal of each level.

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[151] See *Doom* (id Software, 1993).
[152] Mark J. P. Wolf, *The Medium of the Videogame* (Austin: University of Texas Press, 2001), 79.

The pathways of the real world maze are usually fixed, therefore containing the experience within them. This contrasts with the *pathways to* the videogame maze that generally lead the player somewhere else since they are generated as and when the player explores them. Where the real world maze is a dwell-and-enjoy device, a *pathway of* experiences, the game-maze is a *pathway to*, a device for *completing* the multiple objectives of the game. It is the emergent and generative aspects of the game maze that allow it to be a *pathway to* experiences. The paths allow players to use the items contained within the maze structure to solve the levels to progress through the game. In contrast, the mostly fixed, worldly mazes offer a *pathway of* experiences, allowing the user/player to have their experience contained within the paths they walk along in the maze. Although the walker has to make choices in a worldly maze, and the experience can change on different walkings, the pre-defined maze paths remain fixed in their positions whilst the maze remains as a physical object. The following table, in Figure 4.6 was constructed as a way of analysing the differences of each maze type at various periods throughout history. It is a heuristic tool that extends of the previous table highlighting Doob's own findings about labyrinths and mazes.[153]

The table sums up the different spaces offered by each path type, from the labyrinth found within a more social context of the village common or local church, to the hedge maze enclosed in the garden open to those able to afford a visit, to the videogame that is now accessed by machine space within the confines of various rooms within our homes or the arcade. The meanings of each path type has also shifted, from their designs as singular paths symbolising endurance and ritual, to the multiple path mazes making the walker find their way to the goal and unlock the secret of the correct path in doing so. This can be seen in contrast to the game maze, with its *pathway to* experiences, causing the player to get lost in many ways, through the trial and errors of solving puzzles, gaining rewards and unlocking further paths in order to continue. The videogame also reworks the multicursal structure, appearing to be polycursal. A polycursal structure can be one seemingly constructed of many paths, with the more definite multicursal structure becoming lost through the pathway to experience of the maze. The table can be used to understand how the labyrinth, maze and videogame are now depicted and used within today's society. Both the real world labyrinth and maze are subject to rare visits by the public, with the labyrinth commonly being seen as a place of ritual, as opposed to the visits to hedge mazes found within the gardens of tourist attractions. It is now through the ubiquitous nature of the videogame that the maze can be visited everyday, albeit as a virtual experience.

[153] See Figure 4.3 for Doob's findings.

Labyrinth	Maze	Videogame maze
The Troy (turf cut)	The Hedge (gardened)	The Game and other interactive media
Unicursal	Multicursal, the bivium of decision	Polycursal
Pathways of…	Pathways between….	Pathways to…..
Ontological – about being on a path that has only one end	Existential – about choosing the path and bearing the consequences of those decisions	… the consequences of represented paths,
Durational, endurance Central, or peripheral, an inevitable destination, possibly reversed, or inversed as a way out	Spatial, Goals, solutions, knowing the secret	Puzzle, Rewards, power-ups, on-the-way collecting
Lost within the turning of the single path	Lost by confusion of decision making	Lost by many means, plurality
Open to the inward view of others, able to view others	Occluded views in both directions… hidden secrecies	Virtual views and plural viewing… inhabited by avatars
Public	Select Group	Private
The commons	The garden	Machine space in a private room/mobile 'place'
Rare, infrequent, travel to experience. Pilgrimage	Rare, pleasure garden spaces, partly 'domestic', partly touristic	Everyday (with the privilege of technology access). Ubiquitous yet virtual.

Figure 4.6 Characteristics of labyrinths, mazes and videogame mazes.
Edited from Alison Gazzard and Alan Peacock, "Folded Space: How Computer Games Rework Our Ideas of the Maze." Paper presented at *ISEA2008* (Singapore: ISEA2008 Pte Ltd, 2008)

The experience of the individual moving through the videogame maze may be different from the experience of other mazes, but the inclusion of obstacles and random procedures in the videogame maze separates this as a *pathway to* experiences compared to the *pathway of* experiences of the real world maze. The generative nature of the emergent path, also occurs within the real world Japanese maze craze of the 1980s.[154] These mazes, constructed of

[154] For more about Japanese panel mazes see, Jeff Saward, *Magical Paths: Labyrinths and Mazes in the 21st Century* (London: Octopus Publishing Group, 2002), 68-69.

wooden panels meant that each panel could be moved to generate different path formations whilst walkers were making their way through the maze. This led to some of the mazes having competitions as to who could get through the maze in the quickest time possible, whilst navigating their way through the ever changing path structures. In comparison to this type of generative path, the videogame path is often generated by the events happening along the path. Whereas what is encountered along the path is as important as to how to unlock paths within the videogame, the walker's aim of the worldly maze is to find the correct path to take them to the goal.

It is also possible to see how the videogame maze may have also impacted on the worldly mazes in recent years. The *Dragonfly Maze* at Bourton-on-the-Water, UK, constructed in 1995, can be seen as a typical hedge maze, in that walkers have to find their way from the entrance to the exit of the maze. However, in exiting the maze, there is a puzzle to be solved, and it is only through finding clues on the floor along the way (such as the one shown in Figure 4.7) that the final puzzle can be completed. Walkers do not have to find the clues and complete the puzzle to exit the maze, they are still free to exit the path regardless of any clues they may have found. The puzzle, however, acts as an added extra, and can make walkers stay in the maze for longer, exploring all the maze paths in the hope of completing all the clues. In this way, the puzzles can be likened to those solved along the maze-like paths of the videogame. Therefore, although labyrinths and mazes of the real world have their histories, their meanings are also still evolving over time as other meanings start to become attached to the experience of walking their paths.

Figure 4.7 Clue found on the floor of a path at the Dragonfly Maze, Bourton-on-the-Water, UK

4.6 Conclusion

In understanding the cultural shift of the labyrinth and maze from the ancient to the post-modern – via the Renaissance - it also became clear how the experience of the maze in each of these instances has also shifted. This was also seen in understanding the differences between the unicursal, multicursal and videogame maze paths within a contemporary mindset. Whereas the labyrinth is now associated with ritual and being able to see the design of the paths laid out in front of the walker before walking them, the multicursal maze is seen as a place of play and of problem solving in trying to reach the designated goal.

This chapter shows the different uses and depictions of the labyrinth and maze through the work of Doob and Kern. It shows how the unicursal model and multicursal model can be seen independently, each offering a different experience for the walker. The chapter also highlights how the uses of labyrinths and mazes have sometimes been modified in today's society. It has now opened up a discussion about how the videogame now starts to rework these ideas and may have started to also influence the design of real world mazes nowadays. Both real world mazes and virtual mazes seek to confuse the walker/player. Concepts of space in videogames are distorted through identical texture mapping to make relatively small spaces appear larger. This can confuse the player making them spend more time in one particular place although they are constantly moving around. Unlike the real world maze, there is no availability of natural phenomena such as weathering, or differentiation in hedge or path colour to work out their positioning. It is through researching the maze in this way, that Doob's notion of the "duality of the maze" existing as both map and experience has now highlighted the questions of whether this too was possible within the videogame. An investigation of these two terms, in relation to real world mazes and the maze within the videogame, can be found in the next chapter.

5. MAPS TO MAZES: THE DUALITY OF THE MAZE

5.1 Introduction

> Adding to the allure of the maze was the fact that its significance could change according to the context in which it appeared. Placed on a Cretan coin, a labyrinth alluded to the Greek Myth; on a pavement in a Roman villa, it marked a line of defence protection; in a Gothic cathedral, it suggested both death and eternal life. Even the position of the viewer affected the psychological force of the labyrinth: seen as a whole from above, the maze resonated with divine perfection; but experience from within, it baffled and frightened the spiritual pilgrim.[155]

Penelope Doob discusses the maze as both a design and an experience. This is what she refers to as the "duality of the maze".[156] This dual aspect of the maze, as symbol and experience, is a theme consistent in Doob's work, especially as she starts to deconstruct the maze in literature:

> What you see depends on where you stand, and this, at one and the same time, labyrinths are single (there is one physical structure) and double: they simultaneously incorporate order and disorder, clarity and confusion, unity and multiplicity, artistry and chaos.[157]

Both the labyrinth and the maze offer intricate designs that can be appreciated separately to the experience of walking the paths. This is shown through how the labyrinth is often used as a symbol on gravestones and within church courtyards to symbolise the experience of the labyrinth through its design. Figure 5.1 shows a labyrinth design at the entrance to a church. It is too small for the paths to be walked and experienced but the symbolism surrounding its design can still be appreciated. In writing about labyrinths and mazes in the 21st century Jeff Saward comments on the use of the labyrinth in the Christian tradition stating that the "labyrinth design symbolised the tortuous path that the good Christian followed towards redemption, both in everyday life and on pilgrimage".[158] Therefore although the viewer cannot walk the path, it is still a reminder of what the labyrinth may symbolise in the Christian tradition.

The importance of the design of the maze is seen through the various instances of the hedge maze as well as the maize mazes that take shape during the summer months. The design of the maze is given as much emphasis as the experience the maze will offer. Parts of the maze,

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[155] Wright, *The Maze and the Warrior*. 159.
[156] Doob, *The Idea of the Labyrinth from Classical Antiquity through the Middle Ages*. 25.
[157] Doob, *The Idea of the Labyrinth from Classical Antiquity through the Middle Ages*. 50.
[158] Saward, *Magical Paths: Labyrinths & Mazes in the 21st Century*. 23.

such as dead-ends, may appear due to the design of the maze and not necessarily the experience it may offer. This can be seen through the design of the Herb Farm Maze at Sonnig Common, where the first path off to the left at the beginning of the maze, is a large area of dead-end. The space used for the dead-end is needed due to the design of the maze being in the shape of a Saxon sea creature. These designs differ to the design of maze-like paths in the videogame, as creating a dead-end such as the one at the Sonnig Common maze may be seen as wasted geometry. In the videogame most paths will be mapped out in terms of what they can provide for the player. Therefore the map of videogame paths will not have to correspond to a certain pattern when seen by the player. This is not to say that maps and the design of paths are not important within the videogame. Maps however, are built into many games, and will form much of the discussion of this chapter. In earlier top down games, such as *Pac-Man*, the design of the paths are seen, mapping the areas that can be explored. This chapter discusses the duality of the maze and how the experience of maps and mazes in videogames has also changed, compared to the design and experience of the worldly maze.

Figure 5.1 Labyrinth symbol at entrance to St John the Baptist church, Alkborough, UK

5.2 Map and Experience: A Case Study of *Pac-Man*

As mentioned previously, both traditional labyrinth and maze path structures allow for a longer path to exist in a relatively smaller space on the floor. Early game mazes also took advantage of the lack of screen space to again produce seemingly larger paths. It is through a discussion of these two-dimensional spaces that Doob's "duality of the maze" will first be explored. It is here that we return to the game *Pac-Man* for a closer analysis of the map and maze experience that can be encountered within one game. *Pac-Man* is one of the most

iconic maze-based games of the arcade era of the 1980s. Arcade games thrived on players inserting more money; therefore the player's goal was based around high-scores and how long they could keep collecting points throughout the levels. Each game was generally consistent in its structure, with levels constructed of similar architecture and enemies but the speed of battling enemy components was increased, making it harder to remain in the game. This scenario is prevalent in *Pac-Man* and the exploratory nature of such as game is questioned by Jose P. Zagal et al in their categorisation of games, who state "Games such as Pac-Man we argue, do not have spatial levels because the maze is always the same".[159] This statement in itself can be debated in terms of how mazes offer both fixed and generative experiences. The fixed structure of the bounded maze does not change from level to level, but the artificial intelligence and speed of the ghosts increases with each level completion. The top down view of *Pac-Man* gives the player the privileged overview of the maze paths, seeing how each path is linked to one another and how if *Pac-Man* goes through the gap in the path on the left hand side of the screen, the character will then reappear on the right hand side to continue on its journey.

Pac-Man shows the player both the maze design and experience. Although the designed maze does not change with each level and each playing, the experience of the player through the maze paths does. The pills within *Pac-Man* reinforce the maze boundaries, but as the player moves the character along the pill-laden paths, the pills disappear. It is this played experience of the *Pac-Man* maze that becomes the generative component of the videogame path. The remaining pills map out the maze yet to be solved, whereas the empty maze paths show the parts of the maze already explored. The empty paths may have to be explored again as the player has to work out the best ways of obtaining the rest of the pills. At the same time the ghost enemies act as dead-ends trying to stop the player's character moving through the maze. The ghosts move to block off paths, or two ghosts may work together to form the ultimate dead-end that traps the player's character and ends its life. The ghosts and power-pills work together to form maze structured paths by creating dead-ends, changing the direction of *Pac-Man*, creating decisions for the player and therefore changing the end point of the goal of each level. Each new playing of the game sees the emergent maze change as the player shifts their characters movements in order to avoid being captured, and collect as many pills in a row as possible. Each time the player's character dies, the level is started

[159] Jose P. Zagal, Clara Fernández-Vara and Micheal Mateas, "Rounds, Levels and Waves: The Early Evolution of Gameplay Segmentation", *Games and Culture* 3, no. 2 (2008),175-198.

again, with only the pills yet to be collected remaining. This is shown in Figure 5.2 that shows the position of the remaining pills on the second life of the character. The new level offers different path challenges for the player, as they make their way through the pill maze once again. The generative nature of the videogame allows *Pac-Man* players to experience new path structures through the same maze boundaries with each play.

This contrasts to the experience offered by the real world maze. The boundaries of most of these mazes remain fixed, like the bounded paths of *Pac-Man*, and there are often no obstacles for the walker. In order to solve the maze and reach the way out, the walker is more than likely to experience the same paths each time, once they have worked out the path. Producing a mental map of the maze paths can lead to the walker eventually finding that the way out becomes less of a puzzle. This may be one reason why the real world maze led to other uses, but the hedge maze, with its high walls, is rarely encountered using a map to solve it. This then raises questions as to how walkers experience the paths and work out where they are whilst in the maze.

Figure 5.2 Pills remaining after death of *Pac-Man* avatar
Pac-Man (Namco, 1980)

5.3 Text Adventures and Identifying Landmarks

> Looking in on the maze from above, the walker knows where she starts and where she is supposed to go and can preview the route she wants to take. From a first-person point of view, on the other hand, the walker is forced to navigate in order to learn what the structure of the space is and make a mental map of it.[160]

[160] Fernández-Vara, "Labyrinth and Maze."

As the above quotation from Fernández-Vara suggests the maze can offer the viewer or walker two different perspectives, from above the maze compared to being inside the maze. Although the turf labyrinths of the UK at first glance reveal their paths to the prospective walker, in actually walking the paths, the perspective of the walker will change. This can even occur in the unicursal labyrinth that takes the walker in and out of paths winding in a way that they did not originally anticipate when seeing the labyrinth design as a whole. This experience changes once again when faced with the walled paths of the hedge maze. Once in the hedge maze, walkers are rarely given a map, and even if they are, there are no deliberate signs relating the paths of the three-dimensional space compared to the aerial two-dimensional mapping as offered by a map. With or without maps, walkers can become lost.

The real world maze rarely contains arrows signing the way out. Instead, the walker may rely on the natural weathering of path structures, trying to differentiate between one path and the next, or remembering the overgrown areas they have once encountered. In visiting a maize maze at a farm in Richings Park, Buckinghamshire, UK, in the summer of 2007, I observed the changes in path patterns as I tried to navigate my way to the maze's goal. Whilst walking one of the five mazes they had constructed, I soon realised where the dead-ends were by seeing moss and weeds covering the un-walked paths. These areas had ceased to have been walked and trampled on each visit as walkers also noted their status as dead-ends, and that the paths led to nowhere new. Each person came to rely on the other persons visit, making the paths unused and implying they were no longer worth exploring. The signs of the overgrown path led people to trust past experiences of this part of the maze, as once again the new occupants no longer explored the paths further. This can be compared to the pills in *Pac-Man*, the ones that are no longer there sign the path that has already been visited. It is through the act of weathering and the growth of natural elements along the path that is not possible to add to the detail of a physical map. In his discussions of the city de Certeau writes:

> It is true that the operation of walking can be traced on city maps in such a way as to transcribe their paths (here well-trodden, there very faint) and their trajectories (going this way and that). But these thick or thin curves only refer, like words, to the absence of what has passed by.[161]

So although the worn path could be mapped, the levels of wear and decay, and the natural objects that become trampled into the path are ever changing and therefore not easy to update. The process of walking the worldly maze is one that involves a mental mapping on

[161] Michel de Certeau, *The Practice of Everyday Life* (Los Angeles: University of California Press, 1984), 97.

behalf of the walker, a way of organising the various paths into distinct places that have been encountered along the way. Sign systems in real world mazes emerge in a number of different ways to those deliberately installed within the videogame. Whereas in a virtual space the places have to be marked with constructed objects, in the real world place is often marked by nature itself.

A map is usually seen as a separate object to the actual place it represents, it is an aid to help us navigate the place shown. A map can be seen as a diagrammatic representation of an area. We can create maps in our own minds without having a physical reference object to view, by using markers to construct places of reference. This kind of mapping can occur on the fly, in real time, as a personal form of navigation. Yi-Fu Tuan is a human geographer, analysing how people feel and think about space. He discusses mapping in real time as having "spatial awareness and spatial skill" saying that, "walking is a skill, but if I can 'see' myself walking and if I can hold that picture in my mind so I can analyse how I move and what path I am following, then I also have knowledge".[162] When walking a hedge maze it is possible to start working out where you are by remembering visual clues such as how the path is worn differently in certain places or how the hedge is a slightly different shape on different paths. Although confined to the walls creating the boundaries of the hedge maze, you can still get a sense of direction even by taking the wrong paths and eventually working your way to the goal. Small changes in visuals, such as those previously discussed, allow for the creation of personal mapping. Low "affordances" in the landscape create a heightened awareness of our environment in determining our positioning. [163]

This type of mental mapping becomes extremely important in the playing of early text adventure games, such as *Adventure* and *Zork*.[164] These games operate through the typing of onscreen commands to gain a text response detailing the area and position that the player's character is in within the game. Like other videogames, these consisted of the player trying to find various treasures hidden throughout the area they were exploring. Yet, instead of having visual clues shown on screen to depict what was happening, the player has to rely on clues within the text that state location and describe the immediate surroundings. In analysing the

[162] Yi-Fu Tuan, *Space and Place: The Perspective of Experience* (Minneapolis: University of Minnesota Press, 1977), 68.
[163] Donald Norman discusses affordances in terms of how easy objects are to use. Those with high affordances need no explanation, as their use is obvious, such as a handle on a door. Low affordances need more work for the user to understand their use. See Donald Norman, *The Design of Everyday Things* (London: MIT Press, 1988), 9.
[164] See *Adventure* (William Crowther, 1976) and *Zork* (Tim Anderson et al, 1977-79).

text adventure game *Adventure*, Nick Montfort notes, "The pirate's maze offers rooms that are all uniformly described as 'a maze of twisty little passages all alike'. To figure out which room is which, the player character must drop objects to mark the different rooms".[165]

Here the player is using a similar technique to that of walking the real world path or maze (following Hansel and Gretel's breadcrumbs or Ariadne's ball of string). They rely on the placement of distinct objects to remember where they have been and where they need to go. In this case, the significance of not having an object placed in a room denotes a space yet to be explored or recorded by the player. The importance of creating maps in text adventures is reiterated by Montfort again, discussing *Zork*, where "To get through the mazes, detailed mapmaking (or else extraordinary luck, or cheating), is required".[166] These physical maps depict the paths between places, based on north, south, east, west coordinates and the relationship of one object/room to another within the text descriptions displayed. This act of map-making is also discussed by Franco Moretti when he discusses maps created from literary works.[167] This can be compared to the maps created by players of text adventures who are drawing from textual descriptions of objects and locations. Moretti cites the work of Cerreti who states that "objects are analysed in terms of reciprocal positions and distances…whether they are close or far from each other or from something else".[168] This is cited as what Cerreti terms "geometry" not "geography" and he notes that they are not really "maps but diagrams".[169] Even though players of text adventures (or other games) are not technically making precise maps, this mapping or creation of diagrams is vital to understanding path structures.

Text adventure games often did not include save functions due to technological constraints, therefore the creation of maps helped the player find their way back to their old finishing point more easily on each new playing. Using what Yi-Fu Tuan and Kevin Lynch both refer to as "landmarks", the walker/player can be helped with this physical and mental mapping process[170]. A leaf in a hedge can act as a "landmark" and in doing so places the particular path in the space of the maze. The notion of place and space has been discussed by many theorists such as de Certeau and Tuan, with Tuan stating that, "when space feels thoroughly

[165] Nick Montfort, *Twisty Little Passages* (Massachusetts: MIT Press, 2005), 90.
[166] Montfort, *Twisty Little Passages*. 90.
[167] Franco Moretti, *Graphs Maps Trees* (London: Verso, 2005).
[168] Moretti, *Graphs Maps Trees*. 54.
[169] Moretti, *Graphs Maps Trees*. 54.
[170] See, Tuan, *Space and Place: The Perspective of Experience*. 73 and Lynch, *The Image of the City*. 54.

familiar to us, it has become place".[171] In walking the worldly maze the space of the maze starts to unfold as the places of the paths the walker is experiencing. Each path can become its own distinctive place that the walker comes to recognise, mapping where they have been, and reworking this mapping with the new places they start to encounter. This is the same as placing objects within the rooms of the text adventure game *Adventure* where the unidentified spaces, become places through the recognition of known objects. In many ways, in recognising the places we have explored, it becomes easier to think of the narrative of where we have already been. In walking the worldly maze the phrase 'I've been here before', in conjunction with a certain path, can create a narrative of the experience that the walker has encountered. This helps with the mapping process of relating objects and scenes to other scenarios as a way of remembering them.

Henry Jenkins discusses games as spatial narratives within his dialogue with Mary Fuller titled "Nintendo® and New World Travel Writing: A Dialogue".[172] Their dialogue makes comparisons between the discovery of new worlds and charting discoveries through mapping, compared to the exploration offered by videogames. Jenkins starts to argue that although videogame spaces offer us various settings and scenarios, it is how the player moves through and overcomes the various levels of the game that becomes central to playing, rather than the settings the games exist in. He states "The art of game design comes in constructing a multitude of different ways we can interact with these visually remarkable spaces".[173] The narrative of exploring these level structures is a theme running throughout the dialogue, which then focuses on de Certeau's theories of space and place, for whom the narration of events transforms place into space.[174] As Jenkin's notes, "Places become meaningful only as they come into contact with narrative agents… Spaces, on the other hand, are places that have been acted upon, explored, colonized. Spaces become the location of narrative events".[175] Therefore the place is always there; it is the *spaces* of the place that have yet to be discovered. There is a distinction between experiencing the place first hand, and narrating the events that occurred in the space/place after the event. The player of the videogame uncovers the world as it emerges. The generative aspect of the videogame allows for places to be

[171] Tuan, *Space and Place: The Perspective of Experience.* 72.
[172] Mary Fuller and Henry Jenkins, "Nintendo and New World Travel Writing: A Dialogue", in *Cybersociety: Computer-Mediated Communication and Community*, ed. Steven G. Jones (Sage Publications: Thousand Oaks, 1995), 57-72.
[173] Fuller and Jenkins, "Nintendo and New World Travel Writing: A Dialogue."
[174] de Certeau, *The Practice of Everyday Life*. 117-118.
[175] Fuller and Jenkins, "Nintendo and New World Travel Writing: A Dialogue."

viewed differently with subsequent plays. The landscape of the gameworld may never change, but the positioning of obstacles is often subject to slight changes. Recounting the events of the gameworld can be engrained in maps and walkthroughs of other player's discoveries, but the exact timings of what occurs within the game will often never be exactly the same. Therefore the difference between the map and the player experience can be differentiated by the immediate experience of the player on the path - that cannot always be replicated on future playing – and the mental mapping of the player trying to work their way through the level.

This mapping, as mentioned previously, can be saved within physical drawn maps, onscreen displays and walkthroughs. In her evaluation of walkthroughs in videogames Mia Consalvo notes, "Guides solidified for many readers the various elements essential to gameplay, and further hierarchized particular elements such as the game – consistent traveller's guide, bare-bones directions and puzzle solutions…".[176] Walkthroughs found either in magazines, or purchased as separate volumes for individual games contain maps and directions for lost players as well as how to overcome the path.[177] Here the player can look at the map separately to the game experience to gain an overall view of the gameworld. However, it is now possible for games to offer onscreen mapping as well as being able to pause the game and see a map of the gameworld. These games may involve revealing the map as the player unveils more of the gameworld. However walkthroughs are not redundant to these games as they provide larger maps. They also offer the player more than just a map of the gameworld, as they provide the answers as to how other objects along the path might be overcome. It is this experience, of having access to maps through the game that will now be analysed in more detail as to whether it is possible to have the duality of the maze – both map and experience - within the videogame.

5.4 Introducing Map and Experience in 3D Videogames

> The navigational pleasures are richly exploited by the many forms of labyrinths…All of them allow us to experience pleasures specific to intentional navigation: orientating ourselves by landmarks, mapping our experience, and admiring juxtapositions and changes in perspective that derive from moving through an intricate environment.[178]

[176] Mia Consalvo, *Cheating*. (Massachusetts: MIT Press, 2007), 42.
[177] For a history of walkthroughs in videogames, see Consalvo, *Cheating.*
[178] Murray, *Hamlet on the Holodeck*. 129.

Now that maps are included within the majority of videogames, what does this mean in terms of player experience? As discussed previously, the spaces of games such as *Pac-Man* and *Space Invaders* are on display in their entirety to the player.[179] There are no hidden places to find but the experience of the player is different with each playing due to the ever-changing obstacles encountered. This combination of spatial exploration combined with overcoming obstacles has now become a joint theme of the majority of first-person and third-person videogames. 2D side-scrolling worlds in games such as *Super Mario Bros*[180], allow players to uncover different levels stage by stage after overcoming the various obstacles on the path. On the first playing the player may not know what to expect of each level, but multiple experiences of the same world over and over may slowly produce the mental mapping of an area as each stage starts to become more familiar. The inclusion of a map at the beginning of *Super Mario Bros* shows the player the levels they can unlock within each of the worlds of the game. On completing a level the player can then move their character to the next level along the top-down map shown on the start screen. King and Krzywinska discuss the different types of mapping on offer as they discuss the player's restrictions on exploration within the gamespace.[181] They differentiate between maps that are seen as "in-game" and are on the screen whilst the player is navigating the gameworld, and "out-of-game-world maps" that are accessed by the player pausing the game in order to view them.

Within many first-person and third-person games there is the ability to view these "out-of-the-gameworld maps" by pausing the game and being able to see a map of the game area. These maps either exist as overviews of the gameworld, or show the immediate area and some of the linking passages of areas yet to be explored or unlocked by the player. In terms of the maze-like paths of the game, the player is now in many ways able to appreciate the design of the paths as well as experience them. At the same time, many map designs are uncovered by progressing through the game; therefore the design can only be appreciated in its entirety as a reward for game completion. This differs from the design of real world mazes where the design is constant. "Out-of-the-gameworld maps" can be seen to hypermediate the gamespace. As Bolter and Grusin write, "where immediacy suggests a unified visual space, contemporary hypermediacy offers a heterogeneous space, in which representation is conceived of not as a window on to the world, but rather as 'windowed' itself."[182] The "in-

[179] See *Pac-Man* (Namco, 1980) and *Space Invaders*, (Taito, Midway, 1978).
[180] *Super Mario Bros*. (Nintendo, 1985).
[181] King and Krzywinska, *Tomb Raiders and Space Invaders: Videogame Forms and Contexts*. 84.
[182] Jay David Bolter and Richard Grusin, *Remediation* (Massachusetts: MIT Press, 1999), 34.

game" map offers the player a sense of "transparent immediacy", through being integrated into the gameworld's graphical user interface.[183] However, the "out-of-the-gameworld map" temporarily breaks the path of the player's avatar, while the player navigates a separate menu outside of the gameworld.

Figure 5.3 *Metroid Prime 3* in-game map (top right hand corner)
Metroid Prime 3: Corruption (Retro Studios, Nintendo, 2007)

Figure 5.4 *Metroid Prime 3* out-of-game-world map
Metroid Prime 3: Corruption (Retro Studios, Nintendo, 2007)

[183] For more on "transparent immediacy" see Bolter and Grusin, *Remediation*, 34. It should also be noted here that King and Krzywinska's definition of an "in-game" map is to be seen as part of the user interface of the game. This differs to other in-game maps that may be part of the puzzle to be solved in the game, such as actual map objects that an avatar may carry in the gameworld. For the purpose of this discussion reference is made to King and Kryzwinska's definition of an "in-game" map in order to understand how a constantly depicted map as part of the interface may be seen simultaneously to the paths of the gameworld being experienced.

In the videogame *Metroid Prime 3* the player is able to experience both an "in-game" map as well as an "out-of-game-world maps" by pausing the game.[184] The in-game map offers little other than the connection of immediate rooms and an arrow depicting the direction of the player in relation to the area they are in (see Figure 5.3, top right-hand corner). The "out-of-game-world" map is used to show a larger scale of the game world and how rooms are connected later on (see Figure 5.4). This map is uncovered as the player learns to access the different connecting rooms and corridors of the gameworld and the map grows as more of the game is uncovered. Therefore, the design of the mapped paths is emergent much like the uncovering of the paths in real-time as the game is played. Both map and experience complement each other and unfold simultaneously. The map is vital within *Metroid Prime 3* as the game uses structures such as players continually revisiting areas they have previously uncovered.

Figure 5.5 Door in *Metroid Prime 3*
Metroid Prime 3: Corruption (Retro Studios, Nintendo, 2007)

This is shown in Figure 5.5 where each door to the different corridors and rooms looks the same. The map provides a way for players to orientate themselves within the game world both in terms of their direction and the room they are in. Both the "in-game" map and "out-of-game-world" map work together to provide landmarks and directions for the player as they try to differentiate between each room they encounter. Much like the worldly maze, there is a reliance on landmarks within each room space to determine where the player is in relation to the map. Unlike the real world maze, the textures of the gameworld do not fade or change

[184] See *Metroid Prime 3: Corruption* (Retro Studios, Nintendo, 2007).

with each playing, like the weathering that the real world inflicts on the objects within it. The paths of the videogame often appear to be similar, as are the surrounding areas and architecture related to the paths. Having more than one objective, such as overcoming various objects on the path, doesn't allow for the detail of the environments that we have come to experience in the real world.

Although technology has progressed, the attention to detail within the gamespace is not yet at a level to match that of the real world. It is possible to think about detailed gameworlds through Murray's idea of digital worlds having an "encyclopaedic capacity":

> the capacity to represent enormous quantities of information in digital form translates into an artist's potential to offer a wealth of detail to represent the world with both scope and particularity".[185]

However, games do not tend to always offer changing textures in favour of more advanced game mechanics. The player has no real need to stop and take in the virtual world environment if it is seen as a structure to continue moving through in order to encounter the next challenge. Footprints are not created by the player's avatar, and even if the path started to wear away on each visit, on each playing of the game, would players stop and notice? This makes the need for a map within the virtual world even more important as similarities in textures (a product of the economics of technology or deliberate design) can make it harder for the player to establish where they are and can create a sense of being lost much like in a worldly maze. Maps are useful within videogames, where technological constraints or aesthetic decisions do not allow for high affordances and players may be less reliant on landmarks through different texture mapping. Having access to a map through pausing the game creates a work-around for technological limitations. It also allows players to achieve the goals set out by the game, instead of combining this with the added problem solving of working out where they are. It is possible to feel lost within the gameworld, for the player to momentarily not be able to distinguish between one door or room and another, but as King and Krzywinka note, "To be lost in the gamescape is not the same as being lost in the real world, but it shares some characteristics of the real-world experience."[186] Unlike in the real world, it is possible to pause the game or turn it off and seek help elsewhere, whether through walkthroughs or Internet forums.

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[185] Murray, *Hamlet on the Holodeck*. 84.
[186] King and Krzywinska, *Tomb Raiders and Space Invaders: Videogame Forms and Contexts*. 116.

Although problem solving through being lost may be the objectives of some games that do not include maps, the inclusion of the map in larger game worlds makes moving through the space more achievable. Being able to save the game at defined points, either by the player, or automatically through the game code itself, also acts a mapping of the points the player has reached on that playing of the game. Arrows, and other signs are often used along with maps to help the player orientate herself. This is seen in the corridors of *Doom III* that are marked with signs in order for the player to start to recognise how the path differs if they turn left instead of right at a junction. This is shown by the signs in the corridor of the screenshot in Figure 5.6. Again, these landmarks help with save points and returning to a game. Where players choose parts of the game to save and return to may be influenced by areas that they are more familiar with. Through recognising parts of the game that contain paths that are not as easy to overcome, the player can save the game at a safe section of the path in order to build up the ability to progress further after a break from the game.

Figure 5.6 Signs in the corridor in *Doom III*
Doom III (iD Software, 2004)

Now that gameworlds have become larger, the use of on-screen maps and navigational devices (such as compasses) have also become commonplace within the user interface. In *Grand Theft Auto IV* (GTAIV), as with other 3D incarnations of Grand Theft Auto, the player can see a constant map of their immediate area on the screen.[187] This map is used in conjunction with missions, showing the player where important elements such as garages to save the game, shops to buy clothes, and where other characters in the game are situated. When trying to complete missions, this map is complemented with onscreen advice in the

[187] See *Grand Theft Auto IV* (Rockstar, 2008).

form of yellow lines on the in-game map showing the paths to take to get from point A to point B. This is much like a satellite navigation device people can place in their real world cars that give directions to the driver and show a coloured route to be taken. In some respects games such as *GTAIV* offer the player both design and experience, although the design is experienced on a small scale as the map is limited to the area the player's avatar is currently situated in. The onscreen mapping helps the player situate their avatars within the gameworld, through repeated travelling back and forth between certain areas. The garages and homes of characters start to become more recognisable along the directed paths through the connection between the building landmarks on the paths and the subsequent events that occur within the buildings. Parts of the game landscape start to become more familiar through the shaping of certain road paths, and this familiarity leads to the game space becoming placed for the player. Even without the player recognising these places, there is always the back-up of the either the "in-game map" or the "out-of-game-world map" to turn to for help.

Figure 5.7 Out-of-the-gameworld map of *GTAIV*
Grand Theft Auto IV (Rockstar, 2008)

Unlike in *Metroid Prime 3*, the overall gamemap of *GTAIV* - that is accessed through pausing the game – shows the player the world of the gameworld without having to wait for areas to be unlocked. This map is shown in Figure 5.7. The map shows the player the whole gameworld design as well as letting them experience it. This experience is now limited to how many missions are solved in order to unlock all the paths in order to experience the whole map and not just view it. Unlike the real world maze, the gamespace of *GTAIV* can be viewed in its entirety but it is not until all the areas are unlocked that all the paths can actually be experienced by the player. The player becomes more aware of areas that can be explored

through the adding of further landmark icons as new places are accessed and missions completed. As King and Krzywinska state, the viewing of the map shows that "maps can indicate areas that simply appear interesting to visit, at any given stage in a game that offers relatively large scope for movement, without the anticipation of any other immediate pay-off".[188] However, in the case of *GTAIV*, the map acts as a reminder of those areas that can be explored freely as a reward for completion of pre-defined missions and the learning curve associated with such a game.

5.5 Conclusion

Even though onscreen mapping allows for the "duality of the maze" in some respects, the questions of whether videogames offer both design and experience simultaneously still remains open to interpretation. Playing games can be discussed through the discovery of the gamespace. By playing in and experiencing the gameworld, the player in many ways uncovers much of its design. This is a two-way process, with playing and exploring leading to understanding the design, and starting to understand the design aids the playing and further exploration of the game through solving puzzles. Although both processes are happening, they are probably not always occurring simultaneously, but they are processes that link together to create the game experience. It has also been seen that sometimes the design emerges out of the experience, and in turn, the experience can start to emerge out of the design. It is important however to understand both the design and the experience of the path. The designed view may be one not encountered in the same way by every walker/player and it is the experience that allows for a personal experience along the path. At the same time, recognising the path as one that is designed helps to break down and understand how different paths are constructed.

By understanding the "duality of the maze" this thesis now concentrates on the player experience along the maze-like paths of various videogames. It is this aspect, the experience of the player, that sets this thesis apart from other work concerning game elements, which discuss design and experience as separate entities.[189] In order to discuss various paths and what players may encounter along them, there must first be a discussion of how players play videogames and their understanding of how these "rule-based systems"[190] may work. The act

[188] King and Krzywinska, *Tomb Raiders and Space Invaders: Videogame Forms and Contexts*. 87.
[189] See Björk and Holopainen, *Patterns in Game Design* (Massachusetts: Charles River Media, 2005) and Rollings and Adams, *Andrew Rollings and Ernest Adams on Game Design.*
[190] Juul, *Half-Real: Video Games between Real Rules and Fictional Worlds*. 91.

of play along the path (and what happens when players try to explore outside the pre-designed paths) is the focus of the next chapter, Purposeful and Appropriated Play.

6. PURPOSEFUL AND APPROPRIATED PLAY

6.1 Introduction

The previous chapter discussed how the maze could be viewed as both design and experience. Through understanding these two aspects of the maze, it is at this point that the focus shifts to the experience of the player. It is important to understand the types of play available to the player in their experiences of game paths. It is through an examination of the player's experience of maze-paths within videogames that an understanding of how videogames may rework our idea of the maze can be reached. This chapter discusses the various motivations of the player experience, by looking at playing on and off the paths of the game.

The general path that flows through videogames can be discussed in terms of Manovich's "algorithm". Manovich states that, "an algorithm is the key to the game experience…As the player proceeds through the game, she gradually discovers the rules that operate in the universe constructed by this game. She learns its hidden logic – in short, it's algorithm".[191] In learning to play along the path, the player starts to discover the game's algorithm. This discovery can manifest itself in various ways and it is through this chapter that new terms are derived in order to discuss different types of play. In Chapter 3 it was stated, with reference to Mäyrä, that it is important to discuss videogames in terms of the game, the player and the contextual frames regarding them.[192] Within the centre of the edited diagram in Figure 6.1 I have added a fourth element to consider, that of the cultural logic of the game.[193]

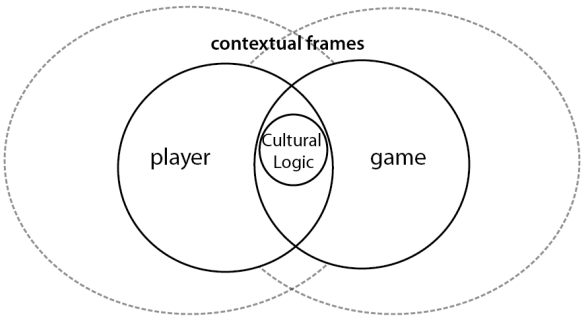

Figure 6.1 Locating the cultural logic in games

[191] Lev Manovich, *The Language of New Media* (Massachusetts: MIT Press, 2001), 222.
[192] See Mäyrä, *An Introduction to Game Studies: Games in Culture*. 2.
[193] For the original diagram see Mäyrä, *An Introduction to Game Studies: Games in Culture*. 2.

The cultural logic can be seen as a way of understanding the culture of videogames. It recognises the exchange of information between players and how game culture is more than just playing the game, it can also be understood as a way of sharing and discussing ideas about games. Players can play in isolation, with their own agenda for a game, whether that be completing the game in the fastest time, collecting all the items thought to be found within the game, or being able to open levels to explore the game under the player's own rules. At the same time, it is important to note that the majority of these acts exist within a framework of other similar players and the games they play. As Newman notes in the opening chapter of *Playing with Videogames*, many approaches to game studies "fail to recognize the socially situated nature of much videogame play as well as the fact that the actual act of playing games is only part of what is involved in being a gamer and being enmeshed in the culture of videogaming."[194] He goes on to say that "playing videogames is not an activity undertaken in a vacuum but rather is one that is informed by and situated within the contexts of other players and their analyses and playing"[195] It is these statements that help to define cultural logic. Games can be social and cultural systems without having to exist within a multiplayer domain. Single player games also exist within a context that there is the acknowledgment of other players playing the same game, striving to find out the same things, or to discover new ones to help other players. This is particularly evident through the use of Internet forums for players to discuss games, online and published strategy guides, and walkthroughs as well as social networking applications available online.[196]

It is through understanding the culture of videogames and the types of play that are formed through or out of it that this chapter establishes these ideas further, to set out a vocabulary for types of play to be experienced along the paths of the game. In returning to Manovich's algorithm, it can be seen that there is more than one motivation for the player in trying to discover the game's algorithm. It is through these motivations that the algorithm itself can be comprised of different components for the player to potentially discover. As Steven Johnson writes in his discussion of playing videogames, "If you don't think about the underlying mechanics of the simulation – even if that thinking happens in a semiconscious way – you won't last very long in the game. You have to probe to progress".[197] The underlying mechanics of the game system can exist as a variety of components and it is these that will be

[194] See Newman, *Playing with Videogames*. 12.
[195] See Newman, *Playing with Videogames*. 12.
[196] For more information on strategy guides, walkthroughs and online forums, see Newman, *Playing with Videogames*, 12, and Consalvo, *Cheating*.
[197] Steven Johnson, *Everything Bad is Good for You* (London: Penguin Books, 2005), 46.

discussed in terms of player motivations throughout this chapter. To do this, the game system will be discussed in terms of Saussure's categories of "paradigm" and "syntagm." These provide ways of understanding the players' motivations in finding other parts of the gameworld aside from its intended gameplay design.

For Saussure, a paradigm is "a set from which a choice is made and only one unit from that set may be chosen".[198] In this case, we can see each videogame genre existing as a different paradigm, with individual games chosen to be played separately. Although the games are related by their medium, each game is structured differently and has different sets of rules, outcomes, and so on. As Fiske states, "Once a unit has been chosen from a paradigm it is normally combined with other units. This combination is called a syntagm".[199] "Syntagmatic relations are the various ways in which elements within the same text may be related to each other".[200] Therefore the videogame as a whole can be seen to exist as a paradigm, containing various syntagms to be explored and discovered. By understanding the game in this way, it is possible to see that there can be more than one set of syntagms within each game. Although there is the syntagm of play as designed by the game designers, it is also possible for players to find other syntagms within the game through a further exploration of the algorithm. The units that create a syntagm can be reordered to produce new combinations of play, therefore different players may seek out new combinations found within the game paradigm in the hope of forming their own type of play. This semiotic approach to understanding the game's algorithm has been used as a way of understanding the player's experience. It is through recognising new sign systems emerging in the gameworld that the player may feel the need to explore other syntagms that could be available, and discover new types of play. Types of play will be discussed through Caillois' categories of "ludus" and "paidia". His categories of play will be amongst the key ideas in defining terms of player experience to be used throughout this chapter, in particular the axis of classification that he defines as ludus and paidia. Caillois' diagram in Figure 6.2 shows how the arrows between paidia and ludus can fluctuate between these two play states. This will be discussed further within this chapter in order to understand the various motivations of players in discovering different paths within the gameworld.

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[198] John Fiske, *Introduction to Communication Studies*, 2nd ed. (London: Routledge, 1990), 58.
[199] Fiske, *Introduction to Communication Studies*. 58.
[200] Daniel Chandler, *Semiotics: The Basics*, 2nd ed. (London, Routledge, 2002), 85.

The two theories of ludus and paidia are also linked to two new categories of play that I define as purposeful play and appropriated play respectively. By playing a videogame, the player's motivation is to get to the next level, complete missions, obtain high scores, and master the gameworld they are experiencing. As the previous quote from Manovich stated, players are trying to learn and understand the "algorithm", through the act of playing the game in order to play successfully. This is what I have defined as purposeful play in that the system opens up to the player and presents rewards for mastery with high scores, the satisfaction of completion, progression to the next level, and so on.

Purposeful play pervades the experience of the game; it runs through tutorials that show the player how to move and behave in the gamespace. It is found in the off-screen manuals that define the goals, present back-stories and offer the instructions for the strategic operation of physical controllers. It persists in the feedback loops of failed missions and retrying times. Purposeful play is about playing within the rules, and in many ways constitutes Caillois' category of "ludus", or play within a ruled games system. Where ludus is rule bound "paidia", in contrast, represents, "wild, free-form improvisational play".[201] Figure 6.2 shows that "ludus" and "paidia" are separate categories but ones that flow in and out of each other. The mapping in the table also shows how as paidia decreases, ludus increases and vice versa. It is these two ideas of "paidia" and "ludus" that will be connected to new concepts of purposeful and appropriated play throughout this chapter.

	AGÔN (Competition)	ALEA (Chance)	MIMICRY (Simulation)	ILINX (Vertigo)
PAIDIA ↑	Racing, Wrestling, Etc. } not regulated	Counting-out rhymes	Children's initiations	Children "whirling"
Tumult	Athletics	Heads or tails	Games of illusion	Horseback riding
Agitation			Tag, Arms	Swinging
Immoderate laughter			Masks, Disguises	Waltzing
	Boxing, Billiards	Betting		Volador
Kite-flying	Fencing, Checkers	Roulette		Traveling carnivals
Solitaire	Football, Chess			Skiing
Patience				Mountain climbing
Crossword puzzles	Contests, Sports in general	Simple, complex, and continuing lotteries*	Theater Spectacles in general	Tightrope walking
↓ LUDUS				

Figure 6.2 Edited version of Caillois' "Classification of Games" highlighting the arrows between paidia and ludus.
Caillois, *Man, Play and Games*, 36.

[201] Chandler, *Semiotics: The Basics*. 85.

Returning to the structure of the videogame, it can be seen that the videogame comprises many parts that combine to create what Manovich defines as the "algorithm". Although the algorithm can be seen in theory to define a set of more or less precise playable syntagms from within an extensive paradigm of game possibilities, it can also offer more for the player. The presence of bugs, programmers' hidden codes and shortcuts for testing, deliberately included cheats and coding strategies to permit modification, and the wilful inventiveness of human players, effectively mean that many game syntagms are in fact not as precise as once thought. This can make the paradigm more extensive than it initially appears.

This extended algorithm of the game may include features that rest outside the needs or requirements of purposeful play. Some of these may frustrate play, while others may augment, extend or enhance it under certain conditions. The discovery of these further syntagms can shift the emphasis of play from the ludic to the paidic, as players appropriate the game's world to their own ends. As Ryan notes, "With their tendency to regard shooters as the quintessential games, videogame studies have so far privileged ludus at the expense of another type of ludic activity that Caillois called paidia…"[202] However, it can be understood that Caillois' paidia may be useful as a way of thinking about appropriated play. It is through this chapter that discussions show how both ludus and paidia can be used within what are seen as primarily ruled games, and how different play can emerge through the discovery of other elements within the game system. Definitions of purposeful and appropriated play lead to a model of players' motivations being proposed as a way of understanding players exploring the gameworld. This enables a discussion about the experience of players who resist the norms of purposeful or ludic play, and how it is possible to play both on and off the pre-designed paths of the gameworld.

6.2 Defining Purposeful Play

> "The act of playing is very close to exploring…"[203]

On entering Huizinga's "magic circle"[204] the player is submitting themselves to the rules of the virtual space. This includes the way they can press up, down, left, right controls in order

[202] Marie-Laure Ryan, "Beyond Ludus: narrative, videogames and the split condition of digital textuality", in *Videogame, Player, Text*, ed. Barry Atkins and Tanya Krzywinska (Manchester: Manchester Univeristy Press, 2007), 26.
[203] Marc Maurer and Nicole Maurer, "The Uninhibited Freedom of Playfulness", in *Space Time Play: Computer Games, Architecture and Urbanism*, ed. Friedrich von Borries, Steffen P. Walz, and Matthias Böttger (Berlin: Birkhauser, 2007), 353.

to move through the gameworld, the way in which pressing button X allows them pick up objects, as well as learning the mechanics and rules of the world. Many games now guide the player through the initial learning curve of the game world experiencing tutorial levels, or handy hints as they progress. Each successful understanding of a combo-action, a way of jumping/running, or picking up an object, rewards them with a friendly text message on screen, the score count increasing, or a new level unlocked awaiting their next challenge. These signs, deliberately installed within the game system, show the player that they are on the right path to succeeding/failing at the game and are experiencing the purposeful play of the game.

Figure 6.3 *We Love Katamari* tutorial level
We Love Katamari (Namco, 2006)

Goals and feedback in purposeful play can be linked to the tutorials at the start of the game. These can sometimes be preliminary levels to games, such as the first level of *We Love Katamari*[205]. During this pre-level, the controls of the game are explained to the player, including how to complete certain moves using various control-combos in order to progress to the first real level of the game. These controls are shown in Figure 6.3. There are no scores in the preliminary level, only text based rewards. This level is designed as a graphically uncomplicated version of subsequent levels, in order to act as a guide for what the player may come to expect of the rest of the game. Players are shown how to pick up items, how to move forward and backwards, turn quickly, as well as other important moves in order to grow their Katamari and break through into subsequent levels of the rest of the game. The level expands

[204] Huizinga, *Homo Ludens: A study of the play element in culture*.
[205] *We Love Katamari* (Namco, 2006).

as new control feedback loops are grasped, acting as a teaser for the timed, score-reward version of the game to come. Feedback loops familiarize the player with the purposeful play syntagm, they reveal what is expected of them, and what constitutes the norm of the game.

Learning the pathways and skills needed to conquer the path(s) is also evident in the beginning of *Prince of Persia*.[206] During the opening part of the game, after the intro movie, the player's avatar has to start chasing a female character. In following the path of the other character in the game, the player is taken down a particular route within the game, making the first movements in the game being about how to run, jump between platforms, and run along walls. These actions are learnt in sequences through onscreen instructions showing which button combinations to press and at what moment. The initial learning of the controls is not combined with the player having to determine which route to take within the game. This is unlike the beginning of many other games where these two actions of path exploration and button press loops are happening simultaneously. In *Prince of Persia*, the female character stops at certain sections in order for the player's avatar to catch up with her. Once the player learns most of the movements of the avatar, along with newly acquired fighting skills, the female character runs off again. As the player's avatar is trapped along the path they came in on after following the female character up to a higher section of the scenery, the player seems to have no choice but to move their avatar to follow her. Once again, the opening paths of the game have in many ways been determined through the following of another character, but this aids the player in learning the initial rules of the game. It sets out an outline of how the game world may be approached from the beginning, and therefore the signs and sequences that the player may associate with good gameplay and being on the right path to completing the game.

Just as there are reward signs, there are fail signs too, such as character life deterioration through missing heart icons, or the loss of points, with the score counter decreasing, and coins spilling out in the game world to be hurriedly re-collected. The game starts again, and the learning process continues. These reward/failure feedback loops are about normalizing the algorithm, and consolidating the restricted code of legitimate play whilst experiencing and being rewarded by the purposeful play syntagms of the game paradigm. These signs expose the rules of play, lessening the chances of discovering opportunities for aberrant play, and reducing the chance of the discovery of further syntagms.

[206] *Prince of Persia* (Ubisoft, 2008).

Both of these feedback loops permeate the syntagm of playing within the rules. This constitutes Caillois' category of "ludus". These rules help the player in their mastery of the game, providing feedback and rewards for completing sequences, picking up the correct items and even moving the character forward or backward along the game path. The game path emerges further through this mastery, and so learning how to generate it becomes important in the first moments of the game. It is through this learning process that the player starts to understand the particular syntagmatic of the game. The purposeful player is content to stick to the rules of the game's world as revealed to them, to beat their high scores, to solve the hidden puzzles, unlock the next level, to hopefully complete the game. It is through these definitions that the purposeful player can be seen in terms of Bernard Perron's category of the "Gamer", someone who is "bound to the rules and limits of the game universe and gameplay."[207] This type of player only sees the one syntagm within the greater game paradigm and they feel no need for further exploration, or discovery of further syntagms, as the pre-defined game world is enough to satisfy their experience. However it can be seen that this is not true for all players, therefore this chapter now explores what happens when the player starts to explore outside of the limits of what I have defined purposeful play.

6.3 Defining Appropriated Play

> "The act of playing is very close to exploring and redefining existing boundaries."[208]

Instead of seeing one syntagm of the rules/goals within the game paradigm, it is possible for the player to start to recognise other signs of further syntagms within the game to explore. The player in this instance may see themselves moving away from purposeful or ludic play to a form of exploration which can, initially at least, be seen as paidic.[209] This is what I term appropriated play, the act of discovery and exploration of the algorithm, trying to find more than the designed rules of the purposefully played game. Playing a videogame can lead to the fortuitous discovery of other aspects of the game's world. These discoveries that fall outside of what the player perceives to be the immediate game syntagm can be seen as an intrusion during purposeful play. They are usually discarded or ignored by the player as they continue on their mission to master the game. These discoveries are more than likely to cause

[207] Bernard Perron, "From Gamers to Players and GamePlayers: The Example of Interactive Movies", in *The Videogame Theory Reader* , ed. Mark J.P. Wolf and Bernard Perron (New York: Routledge, 2003), 242.
[208] Maurer and Maurer, "The Uninhibited Freedom of Playfulness."
[209] Paidic is a term derived from Caillois' "paidia" in *Man, Play, Games*.

annoyance or be seen as a trap by the purposeful player. Instances such as these can be seen in terms of glitches within the game system. In his book *Playing with Videogames*, Newman defines "a glitch, or 'bug' as it is sometimes known, [as] a generic term of the result of a programming error."[210] Whilst playing *Lego Indiana Jones* the player's avatar can become stuck in the sand of the gameworld behind other objects, or buttons that usually allow entry to vehicles may in some scenarios stop working.[211] Both instances cause a forced restart of the game, for the player to resume using the once disruptive actions and see the glitches disappear. Any effect of the glitch remains temporary for the purposeful player as they continue trying to beat the rules of the intended gameworld.

Appropriated players on the other hand strive for these fortuitous discoveries; they are seen as an opportunity for further exploration of the system. Players starting to move into the realm of appropriated play are what I will term aberrant players, those seeking to decode the game paradigm in different ways to those that play purposefully. Some of these players may decide to disrupt the game, turning the algorithm on itself and bringing the game to a halt. These players I define as disruptive aberrant players. For them purposeful play has become perverse play as they seek to disrupt the state of the game inappropriately by implementing the rules perfectly. It may be that this only happens within social game scenarios as it can be seen as an act of showing off. This is comparable to Salen and Zimmerman's player type of the "spoil sport", who acts as "a player that refuses to acknowledge the authority of a game in any way. These nihilistic players do not hesitate to destroy the magic circle of the game".[212] In discussing play occurring within the magic circle, Salen and Zimmerman question the attitude of the player entering the gamespace. In doing so, they raise the concept of the "lusory attitude" which is defined by Bernard Suits as allowing players to "adopt rules which require one to employ worse rather than better means for reaching an end".[213] Although this sounds pejorative, Suits is in fact stating that on entering a gamespace, the players are all silently entering a contract to play by the rules of the defined game. This can be seen in light of the cultural logic of the game, by the players understanding the game scenario, its rules and the context in which the game and its players play the game. It can therefore be seen that the lusory attitude of one (or many) players changes when aberrant play occurs, in particular that of disruptive aberrant play.

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[210] Newman, *Playing with Videogames.* 114.
[211] *Lego Indiana Jones: The Original Adventures* (Travellers Tales: LucasArts, 2008)
[212] Salen and Zimmerman, *Rules of Play: Game Design Fundamentals.* 308.
[213] Salen and Zimmerman, *Rules of Play: Game Design Fundamentals.* 97.

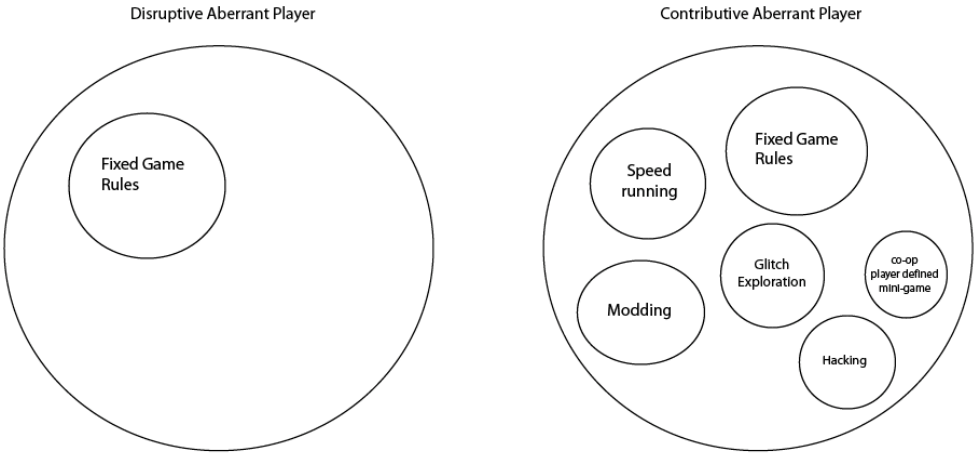
Disruptive aberrant play is distinctly ludic as it is founded in a paradoxical denial of the rules while playing within them. This can be seen in Figure 6.4 that shows a comparison between disruptive and contributive aberrant players. In seeking to win the game, the player may cheat, turn off the game system, pause the game at a crucial point, or walk away mid-competition. Instead of playing strictly within the rules of the system, this player is disrupting the game, breaking the rules, but not for the benefit of anyone playing within the rules. They deliberately seek to sabotage the game, and that cannot be seen as playful. There is no fun aspect in this type of play, and although the player is recognising other rules outside of the clearer signs of the game world, they are not using them to any advantage in their exploration of the game system. In many ways, the disruptive aberrant player can be seen as the stereotypical cheat, the game player who hates to lose, and uses any means possible to stop the competition when it is not going their way. This is where we can see cheating as a sub-category within appropriated play, through the acts of the disruptive aberrant player.

For other players, reaching a state of "flow" within the game, and then falling outside of that state during a time where the player wants a break from the game, the glitches in the game system may start to become exposed.[214] The player may have completed all the levels yet are still craving more. They may seek to find an easier/quicker way of completing certain sections. Players may want to explore the algorithm further to re-instate the experience of "flow" that they once had, or extend the other pleasures of the game in some way. What I will term the contributive aberrant player creates this experience. They too seek out new ways of playing the game, of finding out what else is on offer in their exploration of the algorithm. Contributive aberrant players are those who, for intrinsic or extrinsic reasons, seek to discover hidden features of the game, and through this enrich their play or that of others. These hidden features come from deliberate or inadvertent combinations of algorithms and user actions. Players are seeking to decode the algorithm of the game in different ways, to explore the logic of the game's world away from the norm of purposeful play and its rewards, and to achieve different forms and levels of satisfaction in their engagement. This can be seen in Figure 6.4 where these two types of player are depicted in terms of how they may see the game.

It can be seen by other players that the disruptive aberrant player only has one motivation within the game. However, disruptive aberrant players are also seeking to contribute to the cultural logic of this type of gaming sub-culture. Videos are posted on YouTube of their new

[214] For the theory of "flow" see, Mihayli Csikszentmihalyi, *Flow* (London: Rider, 1992).

type of gameplay, and online forums are set up to acknowledge how to go about using these types of play. Although the disruptive aberrant player's motivation is to disrupt the fixed game rules there are multiple reasons for doing this such as showing off to their peers, or extending their own knowledge of what the game may allow. In the same way the contributive aberrant player has many different motivations for changing the play in the game. Just as players experience the same game in different ways, the contributive aberrant player has various motivations for their discovery of further syntagms of the game paradigm. It is these various motivations that will now be discussed to understand ways in which players can experience the gameworld.



Disruptive aberrant player only seeking to disrupt the game rules.

Contributive aberrant player, seeking to temporarily disrupt the game rules in search of new types of play/game experience within the game.

Figure 6.4 Disruptive Vs. Contributive Aberrant Players

6.4 Player Motivations

My initial analysis of motivations of appropriated play identify a set of conditions such as boredom or anxiety, a desire to beat the system, or to improve gameplay. This may be a response for poor design or a need to amplify fun or reward in a well designed game. Players may wish to demonstrate creativity or originality among their peer group, through hacking or modding, and in doing so, gain respect of the gaming community and recognition for their achievements. All categories can be connected to each other in various ways and one motivation may be linked to another in certain play experiences or as time progresses. The motivations and how they can be linked are depicted in Figure 6.5. They are not to be seen as

single entities but as ideas that work together as a way of discussing how players can experience the same game setting as an individual or group. These motivations can all be seen as ways of the player moving from the pre-defined central path of the videogame, in order to explore further paths and the syntagms connected with them.

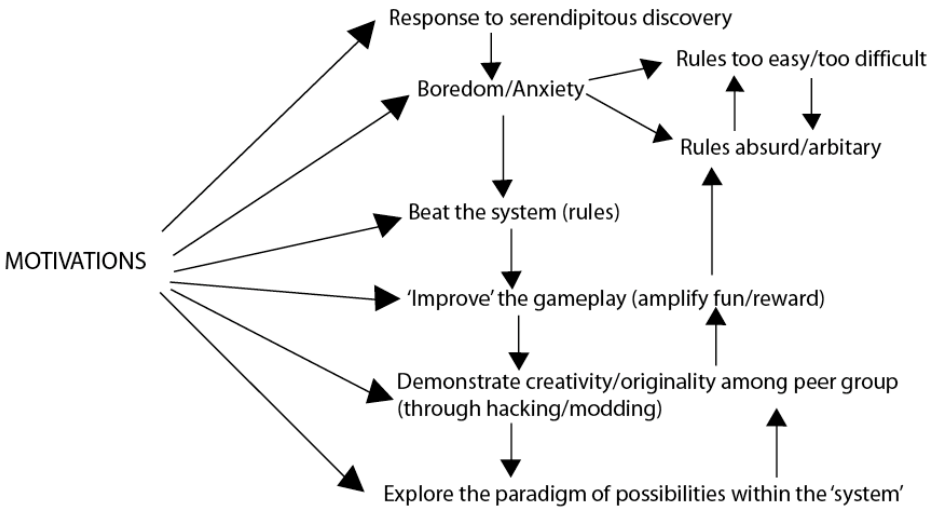


Figure 6.5 Motivations for appropriated play

One of the first motivations outlined in Figure 6.5 is based around the theory of "flow" and the related conditions of boredom and/or anxiety. During purposeful play, a player may start to exist in a state of "flow", defined by Csikzentmihalyi as "the way people describe their state of mind when consciousness is harmoniously ordered, and they want to pursue whatever they are doing for its own sake."[215] Reaching a level of boredom or anxiety, Csikzentmihalyi's categories distinguishing whether or not we are in a state of flow may be due to the rules being too easy or too difficult, too absurd or arbitrary. Although not originally developed as a theory for the videogame experience, it has been proposed by theorists such as Salen and Zimmerman and Juul that Csikzentmihalyi's concept of "flow" can be used as one way of understanding the player's experience within videogames.[216] Salen and Zimmerman state that "The connection between game design and flow experience clearly appears in Csikzentmihalyi's description of the components of flow, the conditions that make flow possible."[217] This "state of flow" is constructed through the player being neither too anxious nor too bored within the game they are playing. For the time it is occurring, the

[215] Csikszentmihalyi, *Flow.* 6.
[216] See Salen and Zimmerman, *Rules of Play: Game Design Fundamentals*, and Juul, *Half-Real: Video Games between Real Rules and Fictional Worlds*.
[217] Salen and Zimmerman, *Rules of Play: Game Design Fundamentals.* 337.

player is immersed within the game world. Their quotidian reality fades into the background until the player decides to end the game, or encounters a level of difficulty above or below that which they have mastered and they leave or lose the state of flow. Csikzentmihalyi sets out his parameters for "flow" in Figure 6.6.

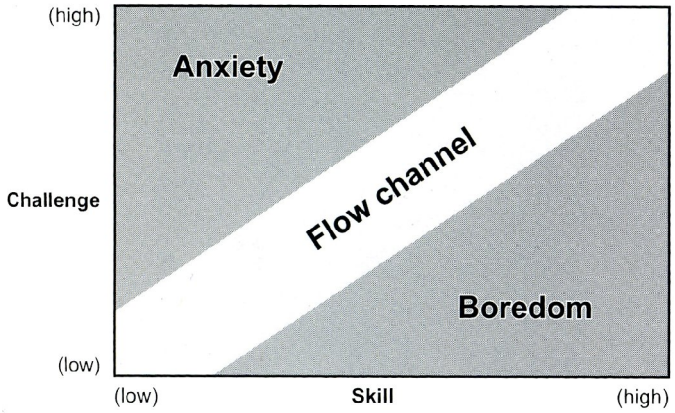


Figure 6.6 The flow channel
Csikszentmihalyi, *Flow*.

This diagram is used in conjunction with Csikzentmihalyi's eight factors that are associated with people being in a "flow state". These factors consists of "the merging of action and awareness, concentration, the loss of self-consciousness, the transformation of time, a challenging activity, clear goals, clear feedback and the paradox of having control in a uncertain situation."[218] Salen and Zimmerman rework these eight factors into two separate categories defined as "the effects of flow" and the "prerequisites of flow" as follows: "The effects of flow:

- the merging of action and awareness
- concentration
- the loss of self-consciousness
- the transformation of time

Prerequisites of flow:

- a challenging activity
- clear goals
- clear feedback
- the paradox of having control in an uncertain situation".[219]

[218] Salen and Zimmerman, *Rules of Play: Game Design Fundamentals.* 338.
[219] Salen and Zimmerman, *Rules of Play: Game Design Fundamentals.* 338.

Although Salen and Zimmerman recognize that flow may not occur within all games and/or for all players, they separate the two categories above in order to understand the key factors in possibly achieving flow when designing (not playing) videogames. The second category "flow's prerequisites" represents conditions in a game that Salen and Zimmerman argue present a greater opportunity for flow to occur. Csikzentmihlayi states that "flow" brings "a creative feeling of transporting the person into a new reality".[220] It is this statement that shares characteristics with Caillois' "paidia" and links with Caillois' other definition of play that states it is "accompanied by a special awareness of a second reality or free unreality, as against real life".[221] Although not every player of every game will reach a "state of flow", or once having reached it continue to attain it, a player may feel that there is more to be discovered about the game's world and its syntagm of purposeful play, than is immediately apparent. In their chapter entitled "Defining Play", Salen and Zimmerman state early on that "from a formal point of view, the rules of a game indeed constitute the inner 'essence' of a game. But there is a danger in limiting the consideration of a game solely to its formal system."[222] They go on to define what they term "transformative play", which in many ways can be likened to my concept of appropriated play. "When play occurs, it can overflow and overwhelm the more rigid structure in which it is taking place, generating emergent, unpredictable results."[223] In this case it can be seen how play can shift from the ludic to the paidic as the player starts to search for further unpredictability within the games system. The play (or in many cases the rules) once associated with a particular game can change and emerge into a new type of play in order to create something new. It could be seen that a motivation for this is through falling out of the state of flow, in that the player becomes bored or frustrated while paradoxically remaining engaged. Players often have an invested interest in the games they are playing. This once again can be seen in terms of the cultural logic of games, through players wanting to get value for money, not wanting to seem foolish amongst their peers, having goals the player wants to personally achieve and by seeking to get the most of the gameworld. It is through this break in "flow", or as a response to serendipitous discovery, or as a way of just trying to beat the rules of the system, that new opportunities can arise for the player which they can choose to explore.

For example, during a game of *Lego Indiana Jones*, players may unlock all the levels in a short space of time, and feel some sense of completion, although they may have only

[220] Csikszentmihalyi, *Flow.* 6.
[221] Csikszentmihalyi, *Flow.* 10.
[222] Salen and Zimmerman, *Rules of Play: Game Design Fundamentals.* 302.
[223] Salen and Zimmerman, *Rules of Play: Game Design Fundamentals.* 305.

officially completed 25% of the game. On having to replay parts of the game, in order to complete 100%, the play may start to become uninteresting, having to replay the same sequence of events to get all the artefacts and coins for each level. In an attempt to make the level more appealing for the player, and re-reach a "state of flow", other new ways of playing may be found. The player may start attacking the computer bot character working with them, or try to find hidden glitches within the game system. Standing at certain places causes players to get stuck in walls, or objects to become trapped between pieces of in-game geometry. The other computer bot player can also become forced to animate on a loop, as they too become trapped due to the positioning of the player controlled central character. What I term glitch exploration can take over as the player's new task within the gameworld. This will to some extent be short-lived, as the player will eventually have to succumb to the rules of the level in order to complete it again and be recognised for their collection of new objectives, or the game will be turned off and no further progress will be saved. But these smaller playful objects created by the player allow them to reach a new and different state of flow and gain reward for personal goals set during this new way of playing. Glitch exploration can lead to players becoming what Newman terms "glitch-hunters"[224], those players that play games to deliberately expose glitches commonly found within particular gameworlds. This type of play provides the player with a status for seeking out glitches, and recording these finds on online forums to gain reward and recognition. Here the play of the game becomes distinctly ludic through recognition of the glitch-hunting syntagm within the gameworld. Newman also links the finding of glitches to another type of play recognized within the cultural logic of games, that of "speed running".[225] Speed running is a type of play associated with players working out how to complete game levels in the quickest time possible and often posting the results online. It can be likened to the player motivation of both trying to beat the system (rules) as well as amplifying gameplay/reward, as seen previously in Figure 6.5. This new type of play is the resultant action of players seeking to define their own rules and create their own type of play through the discovery of this new syntagm. In discussing speed running, Newman notes how "glitches, inconsistencies, and the undocumented features of the game are explored and exploited".[226] Here, glitch exploration in the early stages helps to work out the quickest path for the player and is vital to this type of ludic play.

[224] Newman, *Playing with Videogames*. 114.
[225] Newman, *Playing with Videogames*. 134.
[226] Newman, *Playing with Videogames*. 134.

In trying to separate ludic games into those played by "gamers" and more paidic games played by "players", Perron suggests the player type of the "gameplayer". According to Perron, the "gameplayer" is able to generate forms of paidic play within the ludic ruled game. He discusses *GTAIII* in relation to this, stating that "what makes the success of such a driving-shooting-action-mission-simulation game is there is as much for the gamer that has to accomplish specific missions to do as there is for the player who wants to wander the city and just go on committing various criminal acts."[227] *GTAIII* is frequently used within the discussion of exploratory gameplay due to its seemingly expansive gameworlds allowing for in-game missions along with player driven exploration. Exploring larger gameworlds alongside the creation of in-game missions, can lead to the creation of other player-defined objectives within the game. This allows for both ludic play and paidic play and exploration within the same game scenario. Indeed Chris Bateman states in his essay, "The Anarchy of Paidia", that "play is arguably always on a journey from paidia to ludus, although it would be wrong to think that it cannot also travel back towards paidia".[228] Players starting out within the game system may in many ways experience paidia in trying to work out the rules of the game, and oscillate between states of paidia and ludus during this cycle of learning, as well as exploring what else the game system may offer. Therefore play in videogames does not have to be limited to either one of these states, but can be situated in between the two.

Again, as discussed previously in relation to *Lego Indiana Jones*, players can wander around in free play mode, or even in the story mode, and find personal missions. Perron's player type of the "gameplayer" can be likened to the contributive aberrant player in this respect. They can both experience levels of paidic play within the ludic game. The player has to cooperate with the game system to experience this, in order to unlock further syntagms and experience the extended game's world. This is where sometimes the game system may not open up to the player fully so new motivations call for the need to explore it further, other than through the use of cheat codes. After the first inclusion of an "Easter egg" (a hidden, secret feature) in the game *Adventure*, the act of seeking this extra piece of code and what it may reveal turned into a type of play for some players. Consalvo details the histories of "Easter eggs" in the opening chapter to her book *Cheating*. She explains that Warren Robinett, the creator of *Adventure*, decided to create an "Easter egg" in the game in order to give game designers and

[227] Perron, "From Gamers to Players and GamePlayers: The Example of Interactive Movies.",242.
[228] Chris Bateman, "The Anarchy of Paidia", *Only a Game Blog*, 2005. Available from: http://onlyagame.typepad.com/only_a_game/2005/12/the_anarchy_of__1.html (accessed 14th May 2007)

programmers the recognition he thought they deserved.[229] Consalvo goes on to explain how Robinett made it so that by finding a grey pixel in a room and carrying it to another location, a new room was unlocked displaying Robinett's name in flashing colours. Consalvo states that "the first Easter egg was a useless hidden bonus. It didn't give you an extra life or allow you to change your appearance. It was just there, waiting to be found; nothing bad would happen if you never found it".[230] Although, the first Easter egg didn't give the player any reward related to the intended gameplay, it still gave reward in terms of the experience of working out how to find it, and opened up the notion of exploring extra hidden code within the game system. This links back to the notion of the cultural logic of games, with the player seeking to find the "Easter egg" being part of a community that understands how to explore the game system further and find the hidden extras.

Now with more advanced technology, and larger worlds to be explored, seeking the hidden "Easter egg", has in many ways turned into finding out what else the game code will allow the player to do, enabling them to move beyond the confines of purposeful play. "Emergent gameplay" has been discussed as a new way for the game system to be explored by players. As Julian Kücklich notes, "One of the most famous examples of emergent gameplay is the possibility of using mines to climb walls in *Deus Ex.*"[231] This type of play arises within the original game system and shows the exploration of players trying to find new ways of manipulating objects for different means. Emergent play is a form of contributive appropriated play. It also highlights that the exploration has shifted from the paidic back to the ludic, but the ruled play takes on the new rules as discovered by the player. Therefore out of free-form experimentation in the gamespace comes a new syntagm, which contains its own sets of rules as defined by the player through the cultural logic of the game. This once again relates to the diagram of player motivations in Figure 6.5 of players creating their own type of gameplay to amplify fun and reward through exploring the paradigm of possibilities within the system.

It can be seen that by exploring the games paradigm, the motivations of the player may lead to other areas such as creating artworks from the games world. Therefore players may seek to use this contributive knowledge, through appropriated play, in other ways, to expose the

[229] Consalvo, *Cheating.* 18.
[230] Consalvo, *Cheating.* 18.
[231] Julian Kücklich, "Wallhacks and Aimbots", in *Space, Time, Play: Computer Games, Architecture and Urbanism: The Next Level*, ed. Friedrich von Borries Steffan P. Walz and Matthias Böttger (Berlin: Birkhauser, 2007), 119.

game as art as well as play (or both). As noted by Kücklich, artists such as JODI and Brody Condon use the exploration of the algorithm as a way of exposing the system as a way of art. Condon's own aberrant play becomes an artwork, such as in his piece *Suicide Solutions*[232], which uses footage of game characters committing suicide by turning in-game weapons on themselves. This is Condon's new syntagm with the system, his own experience of using the game setting to expose its other uses. In an interview with Andy Clarke discussing how he is inspired to create new artworks Condon says,

> Usually, I work with these visions from the netherworld that hit me during states of relaxed concentration, especially while playing games. I'm playing the game, I get bored, and I start experimenting, and some kind of image or action that resonates and makes itself clear.[233]

It could be said that once out of his state of flow within the game, Condon looks for other uses of the game system, and it is here that experimenting with what the system can offer in terms of artworks starts to take place. Although this is not the intended game or play of the system, it highlights the system's other uses and what the contributive aberrant player can then form out of discovering its possibilities.

This is particularly evident in hacking or modding games, which can be seen as players other motivations for appropriated play. Julian Kücklich refers to as "cheating" in his essay *Wallhacks and Aimbots*, where players use codes such as "noclip" to render walls obsolete. This code is "…thus be regarded as a means of laying bare the technological foundations of gamespace and of denaturalizing its representational aspects."[234] Rather than cheating, this is actually a way of players exploring the game paradigm and re-constructing a new syntagm that exposes the algorithm that we, as gameplayers, are not always used to seeing. This poses the question of where cheating stops and appropriated play begins, or vice versa. Cheating can manifest itself in various ways as shown by aberrant players, but the connotation of cheating implies deceit and unfair advantage, using hidden codes in order to gain a better score or open up areas of the game, that the player could not solve themselves. Cheats and disruptive aberrant players are not interested in the workings of the algorithm or greater game paradigm. They can be blinded by its syntagms of purposeful play and how to overcome them, whether in isolation such as a player using a code to gain infinite lives or within a social situation disrupting the game to end the competition. Disruptive aberrant players may

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[232] Brody Condon, *Suicide Solutions*. 2004.
[233] Andy Clarke, "An Interview with Brody Condon", in *Videogames and Art* , ed. Grethe Mitchell and Andy Clarke (Bristol: Intellect Books, 2007), 86.
[234] Kücklich, "Wallhacks and Aimbots." 119.

also use codes again such as invincibility to gain unfair advantage over the other gameplayers. Just as with the contributive aberrant player, those seen by others a disruptive players are still adding to the cultural logic of play through uploading videos of their exploits and discussing them online.

Cheating can be linked to appropriated play through the passing of knowledge between the contributive aberrant player to the disruptive aberrant player through the cultural logic of the game. In order for game cheats to be found there needs to be aberrant players willing to explore the algorithm in order to expose further game traits. These players are contributive, adding new knowledge to the foundations of the system. By placing the knowledge online, it may be picked up by disruptive aberrant players, in a search to destroy the game in a social setting e.g. using wallhacks to their advantage in the multiplayer game scenario. Contribution may become disruption through this passing of knowledge. Although, as noted above, what may be seen as a disruptive act by some players, actually contributes to the cultural understanding of different motivations for play. It also extends the cultural logic of games through developing communities highlighting this type of play. Game hacks can also be used for other means than cheating, using the resulting game patch for different means. Within the release of *Doom III*, players are able to use a flashlight in order to guide them through dark corridors, where the enemies await them. The player's avatar cannot carry both flashlight and gun at the same time, making the shooting of zombies and the ability to see an on-going problem in the swapping between each object/weapon. This activity disrupted many players' level of flow and therefore a solution was found and posted online for all to use. As Bob Rehak notes in his discussion of *Doom III*, "to many players, it is a game-disabling error on the level of a bug. There soon appeared a software patch…that allowed flashlight and weapon to be used simultaneously".[235] This modification to the game is not seen as a cheat but as a welcome extra to players of *Doom III*, to enable them to play the game without constantly changing controls. The player experience was fragmented by the original game conditions, therefore the players felt motivated to make a patch for the game. The bug was recognised and then adjusted to suit the needs of the player and the *Doom III* playing community. Aberrant play, motivated by the need to improve gameplay, helped to address a problem concerning many gamers in a similar situation. The sense of community that has evolved through the use of the internet in online gaming forums and online play itself, has meant

[235] Bob Rehak, "Of eye candy and id: the terrors and pleasures of Doom 3", in *Videogame, Player, Text*, ed. Barry Atkins and Tanya Krzywinska (Manchester: Manchester University Press, 2007), 143.

multiplayer games are now more accessible without having to leave the house. Now, through Internet connections, multiplayer games on the PC and home game consoles have become an addition to many game releases. This raises the questions of, how does appropriated play therefore fit into the world of multiplayer gaming and does it differ in respect to its single player counterparts?

6.5 The Multiplayer Game

It is through an understanding of how multiple players can work together within the videogame, that we can start to see how the experiences of videogame paths start to differ from those paths found in the real world. This discussion of the multiplayer game links to ideas of how maze-paths can be experienced in the videogame by more than one player. Many games now include a co-operative (co-op) feature, whether online or in offline versions to the game. Instead of players competing against each other, they play co-operatively, in order to work together to solve missions, kill more enemies and unlock the secrets of the level to progress further. *Lego Indiana Jones* has such a feature. In fact, the whole game is played co-operatively either with a computer bot as the second character, or with a human player stepping in as the second avatar. Some puzzles within the game need two characters as each is used for their own strengths, for example, female characters being able to jump further, and Indiana Jones' crippling fear of snakes meaning he has to step back from some of the puzzles until the snakes have been killed. Outside of the ludic game rules, the co-op feature can allow for some level of paidia for two human players collaborating. This is not possible when a human player is playing with a bot character as they are programmed to follow the original rules of the game. However, in the two-player scenario, paidic play can seep into the original gameplay through player's avatars shooting at each other, and repositioning themselves so that on regeneration, the player's avatar falls off a cliff and dies again. 'Who can discover the most bugs and get the cart stuck within the ditch in the sand the first?' can become a new pastime to break up the monotony of solving the pre-defined rules of each level. Glitch-hunting and glitch exploration are both now playable as game forms through players existing in the same room rather than exploring alone and posting the results online. This type of aberrant playing can be motivated by boredom within the rules of the single game syntagm, and fuelled by a response to the serendipitous discovery of glitches that exist within the system.

Of course, once the play is recognised as a new type of competition, it starts to progress towards being more ludic in nature through the discussion and recognition of the new rules of

this freely developed play. The recognition of this new type of play may be silent, yet both players submit to the new rules of the game. This links back to Suits' idea of the "lusory attitude" and the silent contract signed by players before play. Other types of ludic play can exist outside of the pre-defined game syntagm, exposing further syntagms to play with. Once play is ruled again it becomes named, and this can occur both in the single player and multiplayer experience. Therefore a new named game may need to be explored again. This can occur when the paidic shifts to the ludic. Once back to a ludic game mode, the game may fall into the trap of needing to be explored further. In the multiplayer game scenario, the naming of the game becomes apparent more easily, through the recognition of all players of this new play type. Discovery of what the game system can offer can also be recognised in such instances as the creation of maps for online games, such as *Half Life*[236] and the creation of *Counterstrike*[237]. *Counterstrike* became such a popular map with players that it is now available as a commercial release separate to its first origins as a separate download, and has since been developed as a set of further sequels. Through exploring the algorithm, the players have generated content for other players away from the original game designers content adding to the greater cultural logic of the game. The Internet can now been seen to offer the player as designer in various instances with the growing availability of toolkits and world editors. Appropriated play therefore works by contributive aberrant players wanting to add further aspects to the algorithm for others to see. This itself generates new types of gameplay and rules for the players, for this process to occur again. This can be likened to the game of *Nomic*:

> the rules of nomic are not written in stone. In fact, the object of the game is to make changes to the rules of the game. Players start off following some 'initial rule-set', which dictates how the rules can be changed. Once a rule change has been made, players then follow this new rule set. Most importantly, the rules about how rule changes are made can themselves be changed.[238]

This is similar to the card game of *Fluxx.*[239] In playing *Fluxx*, the game starts with an initial set of basic rules cards laid on the table. The players continue playing, laying different cards, in order to change the rules of the game so that one of them eventually wins. Each time new rule and goal cards are laid down, the emphasis on the goal of the game, or how to reach it may change. Although the game remains ludic, in that it always consists of rules, there is a shift in how the rules are used and perceived, keeping the interest of all players. Here the

[236] *Half-Life* (Valve, 1998).
[237] C*ounterstrike* (Valve, 2003).
[238] Peter Suber, *Nomic.Net*, available from: www.nomic.net (accessed 28th June 2008).
[239] *Fluxx* (Looney Labs, 1996).

changing rules are laid down on the table with no room for negotiation on the new rules, until a player waits for their turn and then can change the rule patterns depending on the cards they hold in their hand.

Emergent rules linked to games such as *Nomic* and the card game of *Fluxx*, are becoming an increasingly common way of playing as the game algorithm is starting to become explored more easily. Games have changed from their arcade beginnings of beating high- scores in *Pac-Man*, and reaching the third level of *Donkey Kong*[240]. The shift has seen the player become the designer in more ways, through the growth in Internet communications, modding communities, and hints as to how to play the game in a different way. Appropriated play has always existed in games. Traditional card games show how the change of play and variations in how the game can be played, has resulted in many different variations of the same game. Discovery of the algorithm has opened up new possibilities and rule sets for the player, and these are up for negotiation in a variety of games depending on the player's skill and willingness to do so. It is through what Salen and Zimmerman term "transformative play" that games and gameplay can evolve for the player, taking them down new, undiscovered paths. As stated in the introduction to this chapter, playing games does not occur within a vacuum; therefore understanding games and players is through recognition of the cultural logic and the contexts in which the games are played.

6.6 Conclusion

As has been discussed in this chapter, exploration within videogames does not need to be limited to the exploration of the depicted space of the game, but may occur when scratching beneath the surface of the game mechanics to see what else may be on offer. This act of appropriated play goes beyond the concept of cheating. Cheating suggests a selfish act of personal gain/reward during a game. Aberrant players in the act of appropriated play go beyond this. In developing a new vocabulary of discussing videogames and play, and what separates them as a media from film and interactive narratives, the term appropriated play becomes a more viable option. Appropriated play is all about discovery, discovery as to what the game world can offer us beyond the mythic norm. This manifests itself through aberrant players with various motivations, such as finding glitches, finding new ways of using the same object such as in "emergent gameplay" or creating new games altogether which new names and rule sets. Whether it be a response to serendipitous discovery, causing the player to explore the system further in recognition of further syntagms within the game paradigm, or

[240] *Donkey Kong* (Nintendo, 1981).

out of boredom or anxiety, having once before reached a state of flow and wanting to re-achieve that feeling, appropriated play is starting to seep into games playing as the systems get larger. Games have always been recognized as having a social aspect to them, bringing a sense of community. Appropriated play allows players to gain respect from their peers, and to have a sense of personal achievement through hacking/modding and finding the codes to unlock the various secrets of the game world. This binds the community and is demonstrated through what has been discussed as the cultural logic of the game throughout this chapter. Understanding the game as having more than one syntagm and the player motivations for uncovering them can be seen as another aspect to this thesis' contribution to knowledge. In outlining the motivations and various aspects of play, a vocabulary of play has now been defined in order to further understand the paths of the videogame.

The change from purposeful play, intended by the designer, to player-led appropriated play within a designed algorithm is important. The growth of larger game systems means there is now more for the user/player to explore, making appropriated play as commonplace as purposeful play, resulting in blurring the boundaries between the two states. The designer may deliberately leave appropriated play hooks within the system, features that can be found, through Easter eggs and the hidden secrets of the game that may emerge during or after the purposeful play experience. It is more than likely that the motivations of appropriated play will figure large, as games become less and less simple levels and more and more the explorable worlds where paidia and discovery predominate rather than rote learning of rules. The distinctions between purposeful and appropriated play are important in the discussion of play along the various paths of the videogame. By defining a vocabulary of terms related to how it is possible to play and explore within various gameworlds, it is possible to now understand these experiences further. It also reiterates the importance of the player's experiences along the paths of the videogame, rather than seeing the paths from a mapped or designed perspective. Through an understanding of different player experiences it is possible to start to see a shift in thinking about maze-paths in videogames compared to those paths experienced in the worldly maze. These definitions of play will be discussed in terms of the experiences of maze-paths and tracks that are now uncovered in the next chapter of this thesis.

7. A MORPHOLOGY OF MAZE PATHS

7.1 Introduction

At the end of Chapter 5, it was determined that in a videogame, the paths through the maze can be experienced in different ways on each playing. Unlike the paths of the worldly maze, videogame paths are generated through the actions of the player. Objects found along a path can act as keys leading to new paths being unlocked and explored. Through the process of walking real world mazes, and experiencing various paths through playing videogames, different path patterns started to emerge. Categories of path were identified through their relationships with other paths, and it is in this chapter that the naming, defining and linking of these path types will be discussed. This chapter outlines the experiences of the different paths players may encounter and how these different paths can be named and discussed. Although attempts to categorise game and level design have been undertaken by others, the focus here is not on the designed experience but the *played* experience.[241] The chapter acknowledges the differences in the played experience and how each path may be encountered and experienced differently on each playing. New sets of rules then start to emerge through the played experience in distinguishing each path type and the associated patterns of learning that are linked to shared and path specific experiences.

This separation of videogame paths from the spaces in which they occur can be summed up by the following statements:

1. The path only exists as it emerges in the display.
2. There is no meta-textual extent outside of the present view.
3. The path emerging in the display is a result of ergodic action and the path is not continuous across any instance.
4. The path is likely to be unique this time round.

Whereas the spaces, places and architecture experienced by the player may be the same on every playing, the paths that the player experiences through this designed architecture may be different. The player cannot always see their path before they proceed on it, paths may change suddenly due to built in random events. Therefore the situations players encounter on each path lead to the path being unique with most plays, even of the same game. This emergent aspect of the path in the display is linked to how the player learns to overcome

[241] See Björk and Holopainen, *Patterns in Game Design*, and Rollings and Adams, *Andrew Rollings and Ernest Adams on Game Design.*

certain paths and unlock others in their exploration of the game space. An example of this can be seen clearly in the Playstation 3 game *Flower*[242]. By using the motion sensing *Playstation 3 Sixaxis* controller, players control a leaf floating through the gameworld, to open up closed flowers to create sounds and unlock other flowers to open. It is through moving across the landscape and opening the first flowers that cut-scenes showing paths between new and old flower patterns can open up through the landscape. Some of these paths are shown in the screenshot in Figure 7.1. Although the player does not have to stick to the paths, they are used as a guiding tool to show where other flowers may be. Once areas in the game are explored and objects are found, new paths are generated and unlocked.

Figure 7.1 The paths of *Flower*
Flower (That Game Company, 2009)

7.2 Unicursal Paths vs Unidirectional Tracks

Chapter 3 explained the difference between paths, maze-paths and tracks. In doing so, it outlined why the maze could be seen as a special type of route, and how unicursal paths are different from unidirectional tracks. In understanding maze-paths within videogames throughout this chapter, there first needs to be a further examination of unicursal paths and unidirectional tracks, in order to comprehend the different paths of the maze. The literature review commented on both Fernádez-Vara's and Taylor's discussion of unicursal path structures in videogames, with links between games being "on rails" quoted as being similar to unicursal path structures.

[242] *Flower* (That Game Company, 2009).

However, the videogame path itself offers the player choices, whether it branches or not. Players have the choice to retread the path, to pause and change direction, therefore the unicursal and multicursal nature of maze-paths refers to how many paths there are to get to the goal or the labyrinth or maze. However, these terms are not related to the direction that the path takes them in. Whereas some games may be unidirectional in that the player can only seemingly move in one direction, this does not necessarily mean there is one path through the game. Games discussed as being "on rails" such as *House of the Dead* can be seen as existing on a single track, with occasional branching structures.[243] Due to the goals of the game being more important than any exploratory navigational elements, games such as these exist on tracks rather than paths. Michael Nitsche discusses the track as a type of spatial structure found within videogames. He states that "games have adopted the metaphor of the track also in other form. So-called rail-shooters move or guide the player along invisible tracks that allow little divergence from a given path".[244] My definition of the track separates this type of route through space from that of the path. Although Nitsche recognises that tracks may appear to be fixed, he also writes about track type paths offering the player some choice through the obstacles or events placed along them.

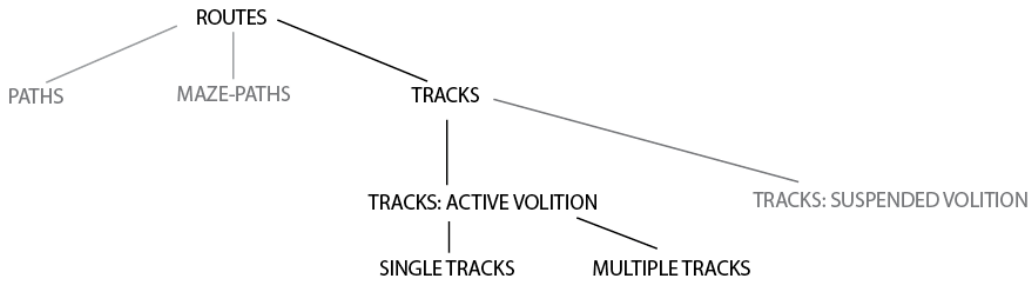

Figure 7.2 Tracks with active volition

Figure 7.2 shows how I have broken down tracks into those with active volition and those with suspended volition. It is tracks with active volition that can offer the player some elements of choice. One of the games in Nintendo's *Wii Fit*[245] involves being able to virtually run around an island, using the motion of the Wii remote to make the avatar run. The avatar is fixed to a track within the gameworld, so the player is not able to control where the avatar goes. However, it *is* possible for the player to pause the game, stop the avatar from running along the path, and decide how fast or slow the avatar moves along the path. Although the

[243] Fernández-Vara, "Labyrinth and Maze".
[244] Michael Nitsche, *Video Game Spaces* (Massachusetts: MIT Press, 2008), 174.
[245] *Wii Fit* (Nintendo, 2008).

track is fixed, the player still has some choice along it. This can be seen in the game *House of the Dead.*[246] In discussing unicursal structure in videogames Fernádez-Vara states that,

> if there is a single path the game feels as though it is 'on rails' like a theme park ride: the user cannot choose where to go. Unicursal structures are thus scarce in videogames. Even games that go 'on rails' such as *House of the Dead* (1997), offer branching paths.[247]

It is true to say that in *House of the Dead*, there is no choice as to where the player's avatar can go throughout the majority of the game, making it exist on tracks. This does not mean that it is unicursal in nature; instead the tracks make the game unidirectional. As discussed by Fernández-Vara, the game does allow for some branching paths within the game. Here, it can be seen that there are multiple tracks to the game, much like different stations where the player has a choice to get off. The player in this instance is on a track with active volition that is constructed of multiple tracks. Once again, the tracks allow for some choice on behalf of the player, such as being able to pause at a certain moment, and decide whether they kill all the enemies along the track or not. Multiple tracks at points within the game level also allow for some choice as to the direction the player's avatar then goes in, but the tracks restrict general movement such as being able to move freely.

By trying to understand the different types of game paths or tracks available to the player, we can start to understand what is occurring along the paths they are experiencing. This also dismisses the distinctions between purely unicursal or multicursal structures within game worlds, and starts to understand how videogame paths can be seen singularly as well as combined. It is through the different path structures inherent in the maze that the player has an opportunity to understand how each of the places within the maze are related to each other. Through wandering around and experiencing different path structures, players can then start to understand the signs and feedback loops within the game. These signs allow for recognition of certain areas and how to start to overcome puzzles built in along different paths. The maze can be broken down into separate maze-emes.

Figure 7.3 shows how unicursal and multicursal maze paths can be broken down further into separate elements of maze-emes. Each maze-eme is a different path type and it is these combined that constitute the morphology of maze paths found within videogames. In the introduction to his *Morphology of the Folktale*, Vladimir Propp states:

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[246] *House of the Dead* (Sega, 1996).
[247] Fernandez-Vara, "Labyrinth and Maze."

> The word 'morphology' means the study of forms. In botany the term 'morphology' means the study of the component parts of a plant, of their relationship to each other and to the whole[248]

Propp's morphology of the Russian folktale takes this categorisation further, by allowing components of the morphology to be moved around and shifted.[249] In botany, if a leaf is cut off it cannot be re-attached somewhere else. In this reworked understanding of the morphology, components can be rearranged into different combinations to produce a new grammar and set of rules each time. The use of a morphology can be seen as being comparable to the ontological approach used by the *Game Ontology Project*, who state "The term ontology is borrowed from computer science rather than used in the philosophical sense. It refers to the identification and (oftentimes formal) description of entities within a domain".[250]

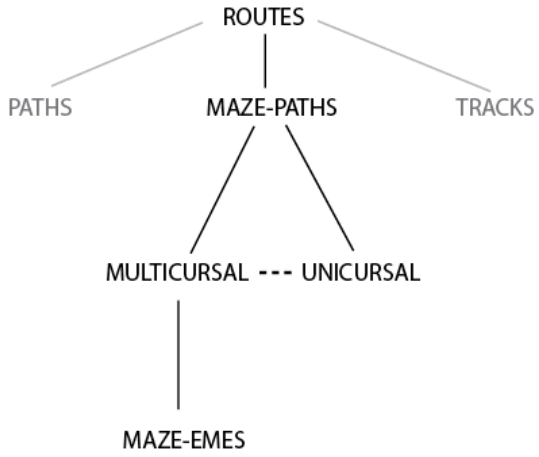

Figure 7.3 Maze paths broken down into maze-emes

Although the morphology is identifying and describing entities found within the maze, it is also creating a vocabulary of how these entities can be discussed as working together. This allows for a grammar to be created surrounding these individual components and rules that may or may not exist in the legitimate linking between each path structure. Using this model is unique as the morphology takes account both separate and combined elements of the path, rather than the descriptions that ontological and typological classifications only allow for. It is the design of this morphology that is one component of this thesis' contribution to

[248] Vladimir Propp, *Morphology of the Folk Tale* (Austin: University of Texas Press, 1968).
[249] Propp, *Morphology of the Folk Tale.*
[250] Zagal, Fernandez-Vara and Mateas, "Rounds, Levels and Waves: The Early Evolution of Gameplay Segmentation."

knowledge. The morphology shows how paths can link together, and how that can be possible through the experience each path has to offer. Whereas a typology would distinguish each path type for its uniqueness, the morphology recognises a joining of different paths. This gives an understanding of how each path can complement one another through how they link together. In his research on the structure of the city, Lynch also concludes that paths are remembered due to their start and end points:

> People tended to think of path destinations and origin points, they liked to know where paths came from and where they led. Paths with clear and well-known origins and destinations had stronger identities, helped tie the city together, and gave the observer a sense of his bearings whenever he crossed them.[251]

Forming a morphology of paths from the fixed path structures of the maze, arose from walking real world examples and identifying paths in a similar way. As the worldly maze is confined to a set space on the landscape, the separate paths of the maze become easier to distinguish. This approach led to the initial design of the morphology through the experience of each path in the worldly maze. It became clear that these paths were also to be found within certain videogames and from here the morphology grew. As videogame paths are generated, as they are experienced within the gamespace, the meaning of these paths often changes along with their uses. There was also an emphasis on what was found along the path that may help to open up future path structures. So whereas each path is identified and commented on throughout the morphology, the emphasis is also on the player's experience of that path and what is found on it. After all, it is the "ergodic" nature of the path, the work required on the path, which is important within this discussion.[252]

7.3 Common Maze-emes

The symbols shown in Figure 7.4 highlight different paths inherent in maze structures. These apply both to the mazes of the real world as well as translating into the paths found within the videogame. They act as a starting point in the discussion of maze paths and start to unravel the distinct qualities these six basic elements have to offer the player. Each path type diagram features a node within it (depicted by a circle). This is usually where the path changes or the path type has been revealed to the player through moving along it. It is through these nodes that each path type can morph into another, following the discovery of how to unlock the way forward. Some paths may require a key in order to be opened up, other paths may open up

[251] Lynch, *The Image of the City*. 54.
[252] Aarseth, *Cybertext*. 1.

through a player's discovery of the gameworld or the "algorithm"[253]. All of these factors will be discussed in more detail within this chapter. Therefore, this nodal structure shows how all paths can work in conjunction with each other, as well as being discussed separately.[254]

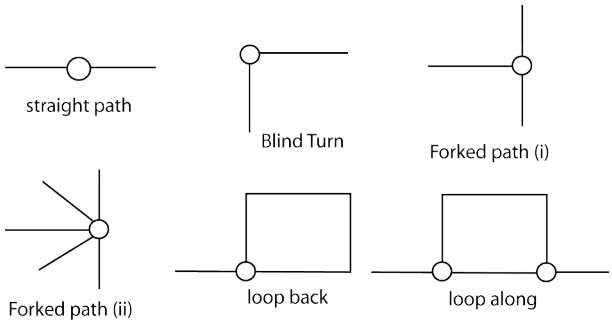

Figure 7.4 Common maze-emes

The first path to be discussed in the morphology is that of the straight path. Straight paths are apparent everywhere, they are what guide us from A to B. The term straight path is used here to symbolise any path that has no use other than to guide us between the other parts of a path. Straight paths can contain other elements such as keys, or rewards, but it is these parts of the path that are the foundation of any path design and are essential in its construction. Straight paths are the defining feature of videogames. They are how player's move through the gamespace. In two-dimensional games, such as *Super Mario Bros*., they can be seen as the path that the player's avatar moves along going from left to right across the screen. In three-dimensional spaces, they are the initial paths that allow the player to traverse the gamespace. The path is in full view of the player until it merges into another path type. They are the streets in *GTAIV*, the corridors of *Metroid Prime 3*, and the open roads of *Mario Kart Wii*[255]. These path types allow the player to see where they are heading whilst on the straight path.

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[253] Manovich, *The Language of New Media*. 222.

[254] These nodes can be likened to Lynch's concept of nodes in the planning of the city, with some nodes being those of "junctions". Lynch states, "Because decisions must be made at junctions, people heighten their attention at such places and perceive nearby elements with more than normal clarity" (see Lynch, *The Image of the City*, 72-73). Lynch's concepts of city planning have been used in other works on the issue of spatiality in videogames. See also, Michael Biggs, Ute Fischer and Michael Nitsche, "Supporting Wayfinding through Patterns within Procedurally Generated Virtual Environments", paper presented at *Sandbox Symposium 2008*, Los Angeles, California, August 9–10, 2008, and Bobby Schweizer, "Representations of the City in Video Games" (Masters diss., Georgia Institute of Technology, 2009).

[255] *Mario Kart Wii* (Nintendo, 2008).

The blind turn develops the idea of the straight path further but now it branches around a corner. In the first instance, it may be confused with a type of forked path, yet on further inspection it offers no choice. It is a breaking of the direction of the path, while the same path still continues and the direction is determined more by the path than the player. This is where the path starts to add some mystery to where we are going. This may be apprehension, surprise or dread. The path allows for a sense of exploration on behalf of the walker/player who anticipates where the blind turn will take them before the approach. Unlike the straight path, where what lies ahead is in full view of the player, the blind turn makes it possible to hide enemies or traps around the corner as the player continues along the direction of the path. Blind paths are more commonly found in three-dimensional videogame spaces. This is mainly due to the fact that blind turns reveal themselves more fully as other path types in two-dimensional games. The purpose of the blind turn in the videogame is to either hide other path types, or lead to expectation on behalf of the player as to what can be found around the corner. The use of blind turns in stealth action games such as *Metal Gear Solid 2* is very common.[256] In *Metal Gear Solid 2*, the player is often faced with enemies lurking around a corner, ready to attack the player's avatar. The corner of the blind turn is often the wall of a building where the player's avatar can hide, and cautiously look around the corner in order to gauge where the enemies may be. The bend within the path can be used strategically for the player's avatar to wait until an enemy has passed, or find a way of attacking the enemy and making the path safe before the avatar continues on it. In top-down 2D games such as *Pac-Man* the blind turn is used in a slightly different way. As all the paths are on display to the player, the path is not technically hidden as it is investigated. However, the blind turn does help to delay the action slightly. In the same way that the player can use the blind turn in *Metal Gear Solid 2* to hide from it's enemies, the blind turn within *Pac-Man* can be used to delay the movement of the ghost enemies as they have to turn a corner rather than go in a straight line. The turn can also make movement for the player's avatar slightly delayed as the player has to move the controller left, right, up or down in order for the character to move around the corner. This requires quicker thinking on behalf of the player rather than the continuous movement of the controller in one direction as the avatar moves along a straight path.

The forked path takes the feeling of mystery and exploration further, as experienced in the blind turn. It too changes the direction of the path, but is not singular like the blind path. The forked path starts to offer the walker a decision about where to go next. The forked path(i)

[256] *Metal Gear Solid 2* (Konami, 2001).

and forked path(ii) function in the same way: both offer the player decisions, with the second type offering us more than the first. Both diagrams of the forked path in Figure 7.4 are representations of how many paths a forked path can offer us and are not confined to the amount of branches as displayed in the diagrams. These types of path are essential to the construction of the worldly maze, as they allow it to have a multicursal nature. The forking of the path offers the player a choice, an important concept to be discussed in this text. Forked paths are part of the nature of choice in videogames. They allow players to explore one area over another when a decision of which path to take is given to them. A clear example of forked paths in videogames is the multiple corridors found within *Metroid Prime 3*. Each straight path has different doors leading off it, offering the player a choice of two or three different path routes instead of carrying on the path they are already on. These new paths open up rooms for the player to explore. They also help to confuse the player in their navigation of the space, as the seemingly wrong path may be chosen at any point in time, and the player then has to work out how to get back to their original starting point. It may turn out that one of the paths chosen leads to a loop-back or a loop-along, the next two path structures to be discussed.

Loop-backs and loop-alongs are paths to deceive the walker. Much like the blind turn, they first appear to take the walker/player somewhere different, but once reaching and experiencing them, the paths can be seen as places of confusion and delay. The loop-back at first starts to take the walker/player somewhere new, and then it becomes clear that the path continues back on itself. They do not offer new paths, but construct a loop to walk around. They differ from a dead end as they do not involve the re-treading of the path. The loop-back delays the walking of the path by using an extended path to bring the walker/player back to her original point of departure. Much like the blind turn, the loop-back within videogames can be seen most commonly through building architecture that breaks up the path. Paths may go around buildings in an attempt to lure players to explore new areas. On moving along the path, the player's avatar may not find anything new, and then see that by following the path, it actually just loops back on itself, using the building as a way of hiding it's looping nature. Alleyways in *GTAIV* commonly turn into loop-backs, where the path doesn't fork, and the player then finds their avatar returning to the point on the path they were originally on before venturing down the alleyway.

The loop-along however is more cunning. It too acts as a loop and delay device, although this time it is mixed with some slight confusion on behalf of the walker/player as they emerge

from the delayed journey further along the original path. In the real world maze and some videogames, the walker/player is then able to experience the missing part of the path in-between that combines the start and end point of the loop. In having a new path to explore what was once seemingly missing may open up a new experience not found originally on the loop along part of the path. The loop-along path in the real world maze acts as a delay-and-confusion tactic, to disorient the walker and prolong the journey further. This differs slightly in the videogame where the loop along can contain extra elements on the seemingly hidden path. The loop section of the path may feel like a new route to be taken, and contain hidden items not to be found on the main path. Unlike a new forked path that does not join up with the original path, the loop-along path allows for items to be accumulated and the original path of the game to be re-joined. Loop-alongs also offer short cuts for players in racing games. In the "Dry Dry Ruins" level of *Mario Kart Wii*, players can use loop-alongs to cut down on the time taken to complete the race. This is because some of the loop-alongs don't have as many objects obstructing the path, compared to the original path of the game. The loop-along path still joins the original path of the game so the player's avatar can continue on its journey, but time has been saved through its discovery. It is through the discovery of loop-alongs such as these that "speed-runners" in videogames seek the position of these paths in games such as *Mario Kart Wii* where the goal of the game is time-based. The aim of the speed-runner is to complete the level in the fastest time possible, therefore any shortcut found in a game helps with this process.

The loop-along path acts as a way of skipping other parts of the game path, yet staying within the game level and continuing with the general narrative of that game episode. Sometimes the paths of the loop-along may be in view, such as in playing *Gears of War 2*[257], where the player has to go into a room off the main path to hide. The loop along in this instance acts as a way of hiding off the main path, yet both paths are still in view. By being able to go into the loop, the action along the main path can still be witnessed. At the same time enemies can be evaded in order to progress through the game without being killed more quickly than had the player remained along the main path. The loop-along allows for spatial progression for the player, a way for them to move through parts of the level quicker, but they are not warped to somewhere new. The path of the videogame has not been disconnected in any way, therefore the player is still continuing on the same journey, simply taking another route. The loop-along is often a common feature of co-operative campaigns within videogames. It allows each player to take a seemingly separate route to their team-mate yet end up along the same

[257] *Gears of War 2*, 2008, Epic Games (Microsoft Game Studios).

path when they eventually meet up. It may at first seem like the players are on separate paths until they find a common meeting ground of the same path. This occurs in the co-op mode of *Gears of War 2*, where the two players are frequently asked to split up and then meet up further along a connected path later on.

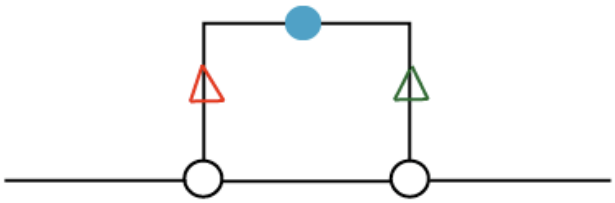

Figure 7.5 Loop Along in *Gears of War 2* Co-op Mode

Figure 7.5 shows how each player approaches the loop along from different directions and once they meet at the blue point, a new path opens up for them both to access. The actions of the two players reinforce co-operative play. Without the players working together, the loop-along would not become clear. Also being able to find each other at the end of the loop-along acts as a reward for both players working as a team. It is now also possible for each of the paths the separate players have moved along to be experienced. This now makes the whole of the loop-along and the path before it accessible to both players within the game.

The vocabulary of the maze permeates videogame paths. It reminds us of how the significance of the maze vocabulary has started to change/evolve through the use of videogame technologies. Path structures inherit old meaning and construct new ones, as shown in the distinctions between the worldly maze and the virtual one. The discovery element of the videogame, and the sense of reward/failure in the playing of the game, contributes to how the paths are structured. In developing a morphology of paths, the importance of Aarseth's concepts of "aporia" and "epiphany" become clearer in the player's ability to recognise puzzles and overcome them within various scenarios.[258] It is this structuring of obstacles along different paths that encourages players learning throughout the game world. The different paths themselves are not separated from the objects/puzzles encountered along them. It is through the concept of 'aporia' that these encounters can be discussed. The term "aporia", however is used within various contexts of Aarseth's works, showing how this term and what it means in terms of the paths needs further clarification.

[258] Aarseth, *Cybertext: Perspectives on Ergodic Literature*. 79.

7.4 What is an Aporia?

The word "aporia" comes from the Greek "aporos" meaning impassable, formed from "a" meaning *without* and "poros" meaning *passage*. The term aporia has been used in literary theory through the work of deconstructionists such as Jacques Derrida.[259] However, the use of the word in this context focuses on how the reader experiences gaps in a text even though they have access to the whole work. Aarseth's first mention of the aporia in *Cybertext* is in making comparisons between the aporia of the book compared to the aporia as experienced in hypertexts.[260] His concern is with how the reader may be stopped in their understanding of the hypertext through not having access to a particular part of it. It is this notion of stopping as opposed to pausing that begins to show how the concept of the aporia relates differently in the discussion of the videogame. As with previous theories of aporia, Aarseth's attention is on the whole text, and not necessarily the reader's experience at that particular moment of coming across an aporia. Aarseth returns to the concept of aporia a few years later in his essay on "Aporia and Epiphany in Doom and the Speaking Clock." Writing about aporias within the videogame *Doom* he states that "In ergodic works such as Doom, the aporia are formal figures, localisable 'roadblocks' that must be overcome by some unknown combination of actions".[261] In order to understand the uses and discoveries of aporia within videogames, it will prove useful to distinguish between different types of aporia and how they relate to their contexts. Instead of using Aarseth's notion of aporia, I want to rework the meaning of the aporia in the videogame to mean a "pause in the path". It may be that the player learns how to overcome the aporia and the pause, or it may be that the aporia is never overcome, thus ending the game for the player at that moment. Using the term in this context enables it to be seen as a way of player's learning how to overcome the aporia, whether the actions are known or unknown, and it is this learning experience that will be discussed later on in this chapter.

Whereas Derrida's and Aarseth's literary perspectives of the aporia focus on the reader's understanding due to a lack of access to the whole text, the aporia in the videogame acts in a different way. Players of a game do not expect to have the full game world available to them: to do so would take away the exploratory and learning aspects of the game that players need in order to keep playing. Discovering the answers of the game and working out how to solve

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[259] See Jacques Derrida, *Aporias* (Chicago: Stanford University Press, 1994).
[260] Aarseth, *Cybertext: Perspectives on Ergodic Literature*. 7.
[261] Espen Aarseth, "Aporia and Epiphany in Doom and the Speaking Clock", in *Cyberspace Textuality: Computer Technology and Literary Theory*, ed. Marie-Laure Ryan (Bloomington: Indiana University Press, 1999).

them are part of the game playing experience and are unique to the medium of the game and videogame. It may be that the player understands the combination of actions in order to get past the aporia, but they need to develop the skill needed in order to overcome it. Therefore the aporia of the videogame can be a deliberately designed feature of the game, a pause in the path, in order for the player to progress and learn the various strategies contained within the game system. Aporia now takes on a modified sense of its original meaning in order to relate more accurately to the videogame and the game playing experience.

7.5 The Aporetic Experience

Aporias are built into videogame paths in order for the player to progress. They are obstacles we overcome, whether that be on the simple individual level of overcoming the control feedback loops or the deliberately designed puzzles that players have to overcome in order to get to the end of a level. Aporias may take the form of the disruptive ghosts in *Pac-Man*; they may be the hidden key to the bridge in *Lego Indiana Jones*; they may be patterns of behavioural understanding as in the combination of actions enabling Chun-Li to spin kick in *Streetfigher*[262]. They are the hurdles players overcome in videogames to aid their learning, discover more of the narrative and to continue playing. Aporias are about the temporary blocking of a path whether that be the virtual path in the game world, or the conceptual path of learning the rules. Through learning and understanding the rules and being able to progress, the path then becomes unblocked.

The aporetic experience is dependent on both game and player and is constructed of various instances as shown in Figure 7.6.

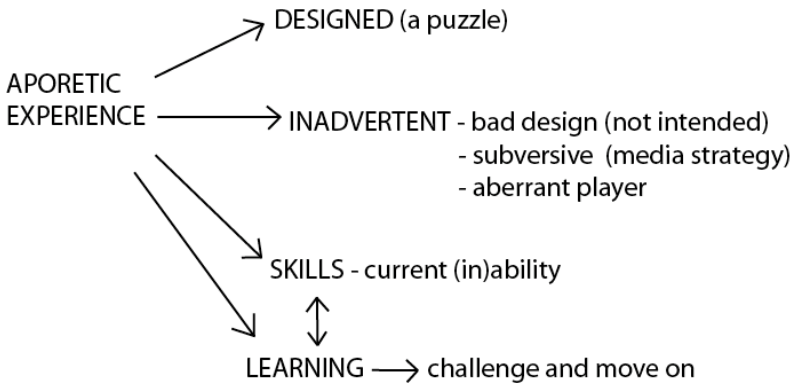

Figure 7.6 The aporetic experience

[262] S*treetfighter* (Capcom, 1987).

Although aporias can exist as designed parts of the game, they also exist within the mind of individual player as they have their own personal paths to overcome separate to those designed within the game system. Designed aporias within the game can be compared to the *Game Ontology Project's* "spatial checkpoints".[263] These contain obstacles that need to be overcome within the game in order to progress, as well as being the places the player returns to within a level if they fail the challenge and have to start again. At the same time, the game itself may have inadvertent aporias through bad design, bugs found in the system, or faulty hardware that cannot be overcome straightaway by the player and not intended by the designer. This type of aporia may also encourage aberrant play in the player, as another way of overcoming the aporia is sought, outside of the intended rules of the system. These different aporetic experiences lead to a discussion of how players approach aporias as shown in the following model of aporetic uncertainty. Whereas the aporetic experience defines types of aporia that may be found by the player, aporetic uncertainty can be seen as the process of the player *working through* the experiences they encounter.

7.6 Aporetic Uncertainty

> "Consider a game in which the player solves a series of puzzles. Solving a particular puzzle allows the player to attempt the next one, and so on".[264]

The *Game Ontology Project* categorises various strategies used within a wide range of games in order to comment on gameplay and game design features. One such category is labelled "Challenge Segmentation", the defeating of bosses, waves or puzzles in order for the player to progress and continue playing the game.[265] These can be seen as aporia within games, but how do players recognise them and try to overcome them? Through constructing a model of aporetic uncertainty, we need to return to Aarseth's use of aporia and how he contrasts it with the "epiphany" that is experienced when the aporia has been overcome. The epiphany is described as "…the sudden revelation that replaces the aporia, a seeming detail with an unexpected, salvaging effect: the link out".[266] This "link out", as Aarseth describes it, can be seen as the linking of the path. Through overcoming the aporia, further movement or discovery along the path is then possible. The word epiphany also links to ideas of the

[263] Zagal, Fernández-Vara and Mateas, "Rounds, Levels and Waves: The Early Evolution of Gameplay Segmentation."
[264] Zagal, Fernández-Vara and Mateas, "Rounds, Levels and Waves: The Early Evolution of Gameplay Segmentation."
[265] Zagal, Fernández-Vara and Mateas, "Rounds, Levels and Waves: The Early Evolution of Gameplay Segmentation."
[266] Aarseth, *Cybertext: Perspectives on Ergodic Literature*. 7.

personal reward as well as the feedback loops associated with overcoming the aporia. This can be related to the subsequent feelings/emotions of the player solving the aporia. In experiencing the epiphany, the player may start to find these aporia:epiphany relationships elsewhere within the game.

Each player has a level of learning within a game. Although the rules of the game may be recognised, the player may not know how to achieve them or have the skills needed to achieve them straight away. This is part of the player's individual learning curve within the game and is linked to the designed aporias used to challenge the player's skill at various intervals whilst playing the game. The aporia may then occur when the player is unable to remain in Csikzentmihalyi's state of "flow".[267] An individual player may be unable to solve the designed puzzle within the game, through being too anxious or too bored. These states can create impassable paths within the game. The player's level of skill at this moment may prevent continuation in the game. This player aporia may be temporary or it may be final, causing the game to be abandoned. This type of aporia can also be overcome by aberrant playing. Players may find another answer in the game system to enable them to progress, through the use of cheats found in online/printed guides, or special codes that enable unlimited lives. They may also enlist the help of a friend to complete this part of the puzzle for them, and in doing so, be taught how to overcome a similar type of designed aporia within the game. This is part of the cultural logic of games, and recognising that games are not always played in isolation.

Aside from aberrant play/help from others, the player may attempt to overcome an aporia by trying to resolve the puzzle to gain the skill level needed. In completing other aporias designed within the game, the player starts to recognise them and develops the skills in order to progress further along the path. The absence of the epiphany signals that the player has yet to complete the challenge. In the case of not overcoming an aporia immediately, and even incurring multiple deaths of the player's avatar, the player develops a better understanding of the skills needed. This is related to what I term aporetic uncertainty, which can be demonstrated by the following set of events:

1. Movement along a path.
2. Pause in the path flow.
3. Cognitive process.
4. Decision/indecision.

[267] Csikszentmihalyi, *Flow*. 6.

5. Action.
6. Consequence (aporetic uncertainty dissolves through the experience of the epiphany or is amplified by failure to achieve epiphany).

In moving along the game path, the player will experience a pause in the action due to various reasons outlined in the aporetic experience. The player does not stop along the path. Instead, there is a pause in relation to the discovery of an aporia. This pause then leads to the player thinking through the area, its obstacles, and how to overcome them. The pause itself can be linked to one of Sutton-Smith's elements of game experience, that of "visual scanning:visual perception".[268] Through scanning the screen for information, and reading the signs of the game, the player may realise she is unable or not sure how to continue progressing along the path she is on.

This thought process links to decision-making (or indecision) on behalf of the player. There may be some frustration about how to overcome the pausing and a contemplation of what action to use next. This links to Salen and Zimmerman's feedback loop representing processes of player decision-making, taking action and the resulting consequences, as shown in Figure 7.7. This process in itself may continue before the player takes the correct action.

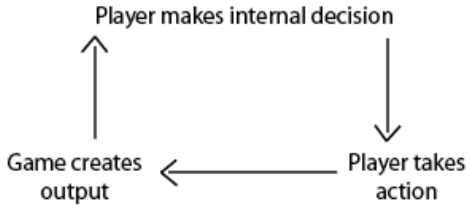

Figure 7.7 Sensory input, player output, and internal player cognition
Salen and Zimmerman, *Rules of Play: Game Design Fundamentals*, 316.

This is one of the main learning feedback loops within the game. The game output created by the player's initial action still may not make progress along the path possible. Therefore a new action may have to be tried until the resulting consequence allows the player to progress. These "motor responses: physical actions a player takes with the game controls"[269]are vital in the feedback loop. Pressing button X on the gamepad may cause the avatar to jump, but

[268] Brian Sutton-Smith's categories are discussed in Salen and Zimmerman, *Rules of Play: Game Design Fundamentals*. 315.
[269] Salen and Zimmerman, *Rules of Play: Game Design Fundamentals.* 315.

jumping may not be the appropriate response to the system, therefore this part of the loop starts again and a new button or combination of actions can be tried until the player finds the desired result.

Through their decision making (see Figure 7.8) the player may have chosen the wrong action in the chain of events, and therefore may not experience the right consequence as the aporetic uncertainty remains and a new period of thinking and decision/indecision (with resultant action) takes place. It is this cognitive process→decision/indecision→action loop that contributes to the learning of the particular game process. This is what Sutton-Smith refers to as, "Perceptual patterns of learning: coming to know the structure of the game itself". It is a process that can also be linked to James Paul Gee's "Probe, Hypothesis, Reprobe, Rethink Cycle"[270], as well as a way of player's learning the game's "algorithm"[271].

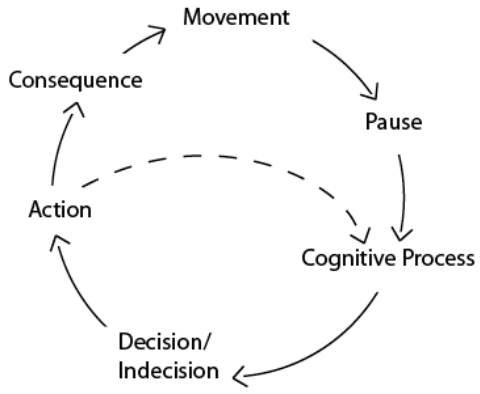

Figure 7.8 Aporetic uncertainty loop

These actions are personal to the player and highlight how each experience differs, with some players overcoming an aporia more easily than others, and
aporetic uncertainty occurring at varying intervals throughout the game. Figure 7.9 highlights the levels of aporetic uncertainty throughout this experience from low to high and back again, showing how the player enters the feedback loop as detailed above. Movement along the path has relatively low aporetic uncertainty until an aporetic experience emerges for the player. This is where the aporetic uncertainty is higher for the player and reaches a peak around the condition of the pause, where negotiations on how to overcome the aporia become part of the player's progress. From here aporetic uncertainty starts to decrease slowly as the thinking and

[270] James Paul Gee, *What Video Games have to teach us about Learning and Literacy* (New York: Palgrave Macmillan, 2007), 87.
[271] Manovich, *The Language of New Media*. 222.

decision-making process resulting in actions and consequences ensues. When the consequence is reached, the level of aporetic uncertainty returns to the same level as when first moving along the path and this is when the feedback loop may well start again. However, if the puzzle is not solved, the player returns to the cognitive process part of the loop and continues within the feedback loop of cognitive process → decision/indecision → action → consequence until the problem is solved, or the game is turned off.

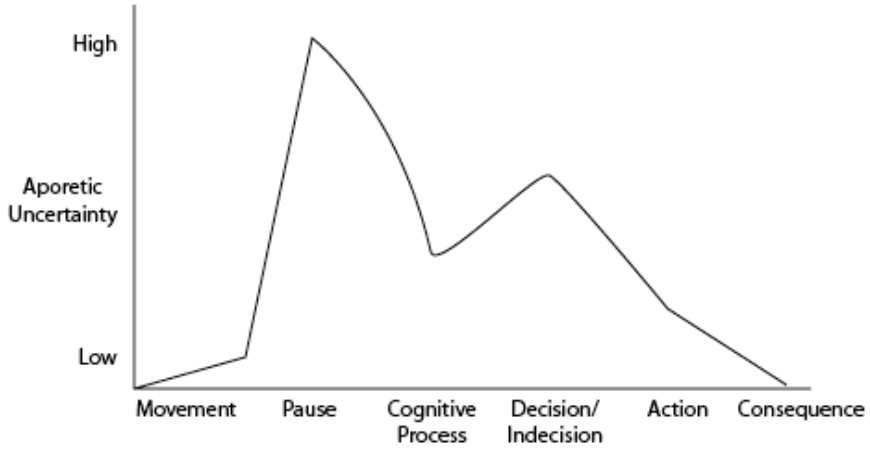

Figure 7.9 Levels of aporetic uncertainty in solving the puzzle

7.7 Learning to Play the Game through Aporetic Uncertainty

The aporetic experience shows how the paths of the morphology may contain aporias within them. Designed aporia may also be the morphing of one path type into another, such as the overcoming of an event on a straight path in order to open up the possibility of a forked path. If games are "ruled systems"[272], then the aporia:epiphany relationship helps the player understand the game rules in different game genres and scenarios. Each aporetic experience may be different for the player or some may start to be more recognisable than others, as the player progresses through the game and starts to extract general rules along similar path types. Understanding the process of how aporetic uncertainty is processed by the player, we can discuss games that may be seen to sit outside of the category of leisure games, including those seen as serious games.

Kabul Kaboom![273] and *September 12*[274] are both labelled as "political games" by Ian Bogost in his book *Persuasive Games.*[275] They rework our understanding of the commercial

[272] Juul, *Half-Real: Video Games between Real Rules and Fictional Worlds*, 91.
[273] Gonzalo Frasca, *Kabul Kaboom!* (www.ludology.org, 2001).

videogame process in order to challenge the player to think about their actions within the game. The feedback loop for learning and the model of aporetic uncertainty can still be applied to such games. From the outset, both games inform the player that they cannot be won (see Figure 7.10 and Figure 7.11).

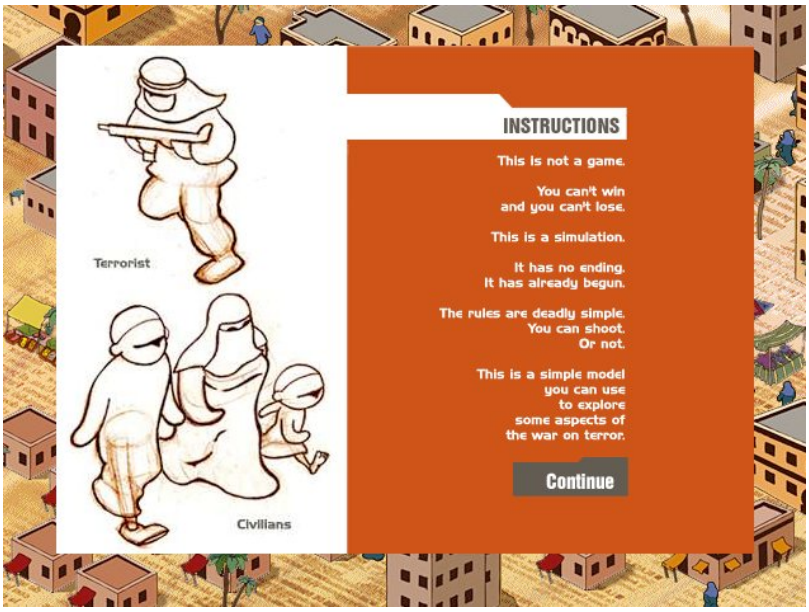

Figure 7.10 *September 12* Title Screen
Gonzalo Frasca, *September 12* (www.ludology.org, 2006)

These games, unlike commercial videogames, lack any information as to player high-scores in terms of how many items have been collected or status bars showing the life remaining of the avatar. In *Kabul Kaboom!* the game is over before it starts, therefore these status bars would serve no purpose. However, players are still able to work out their role in the game through the feedback loops available to them. The aim of the game is to collect burgers as they fall down the screen. At the same time, bombs are falling, disrupting the collection of food supplies. As soon as a falling bomb hits the player's avatar, the game is over and has to be restarted. There are no rewards in terms of entering a high-score, or signing to the player how long they managed to stay alive for, the game is created to make the player think about the consequence of the actions depicted in the game. Levels of aporetic uncertainty are still experienced in trying to overcome the aporia of the game – in other words the falling bombs. The more the player understands the feedback loops, the longer they can stay alive, although it is still a losing battle as the bombs will always win, and it is not possible to avoid them

[274] Gonzalo Frasca, *September 12* (www.ludology.org, 2006).
[275] Ian Bogost, *Persuasive Games* (Massachusetts: MIT Press, 2007).

forever. This process also allows the player to understand how the more common elements of the videogame have been reworked, such as being rewarded for staying alive, being able to destroy the falling bombs, and so on, by having to learn a different action → consequence feedback loop.

Figure 7.11 *Kabul Kaboom!* Title Screen
Gonzalo Frasca, *Kabul Kaboom!* (www.ludology.org, 2001)

The same can be said of *September 12*. The player is faced with a target onscreen and has to work out what its function is within the game. By positioning the target and clicking, the player fires a missile into the town scene. Characters within the game are dressed as either terrorists or civilians and it is left to the player to work out who to try and kill, but in doing so, civilians inevitably also get hurt. Scenes of mourning among the townspeople ensue and the town starts to rebuild itself, only for the player to disrupt this supposed equilibrium all over again. There is no reward for the game, in comparison to the rewards offered by commercial videogames, therefore the player has to rethink the feedback loops they are experiencing in order to understand the underlying message of the game. Aporetic uncertainty helps the player learn the rules of the game even when the game rules are seemingly turned upside down in a new game experience.

7.8 Bridges, Keys and Rewards

Returning to the morphology of maze-paths, there are further path structures to be discussed: those of the bridge and the gate. Unlike the parts of the maze discussed previously, these path structures are in many ways unique to the videogame and are unusual in real world maze design. Bridges do exist in more contemporary hedge maze designs, but the videogame bridge takes the idea further once again. The bridge of the worldly maze allows the walker to see the paths of the maze from higher up, and appreciate the design and layout of the maze space. Finding a bridge in a worldly maze does not necessarily help the walker find their way out more easily, and although it may feel like you can remember the way out from seeing the paths at a higher perspective. In many ways the bridge can cause confusion, as once the walker is back down again at ground level, the previous attempts at mapping generally disappear. For a solitary walker the bridge adds little to the experience of finding the way out, but does add some interest to the maze paths in being able to temporarily view them from above. The bridge can help a group of walkers if one person stands at the top of it and calls out directions for the other lost walkers to find their way to the goal, adding a further element of teamwork to the walking of the worldly maze.

The bridge in the videogame is slightly different. It is a straight path that is broken, therefore creates a puzzle, as the player has to find a way to joining the two paths with the help of a closed bridge. The signs of the path are clear to the player as they can see the section of the path they are currently on and the path they need to get to, yet they are unable to jump between the two paths without killing off the player's avatar or losing some health. Bridges are open until the player finds a way to close them. In closing the bridge the path becomes joined as a straight path once again so that the player can continue on her journey. The bridge acts as an aporia, a puzzle to be solved, and relies on further objects in order to close it. This path structure is one that now exists in combination with the finding of a key, or a cluster of rewards, in order to solve the puzzle and connect two paths together, as shown in Figure 7.12.

Figure 7.12 Open bridge + key = closed bridge

In order to discuss keys within videogame paths, there also needs to be a discussion of rewards and a clear distinction between the two terms. Although keys can be rewards by themselves, rewards and keys have different purposes. Keys are definite objects that have a

use to open up a previously hidden/blocked new path for the player to continue on. Keys can be immediate, in that they are found and used straight away, such as finding a literal key in the same room as the door that it will open. Keys may also be displaced, in that they are found in one area of the game and are used later on in a different area. This type of displaced key can be kept as part of a player's inventory with various keys having individual, specific uses. These keys can then act as part of the puzzle for the player – for instance, when discovering the right key combination to open a particular gate. In games where the player has a limited inventory, keys become even more precious, and decisions about which key to keep and carry is part of a larger puzzle. Playing Blast Theory's *Day of the Figurines* highlights the importance of inventories and keys.[276] In this mobile phone SMS text adventure, the player has to decide which objects are most important to the survival of their character, which is the goal of the game. Each player can keep one item at a time on their avatar's possession. The player then has to determine which item is of more importance as they try to solve clues, help other players and defend themselves in an attempt to not lose any health status.

The greatest difference between a reward and a key is that a reward functions by giving the player a notification of their gain in terms of high scores or extra lives. They are singular and provide nothing more than symbols of achievement at certain intervals within the game. For the purpose of illustrating the morphology, rewards are depicted as yellow points along a path, and keys have a key symbol as shown in Figure 7.13.

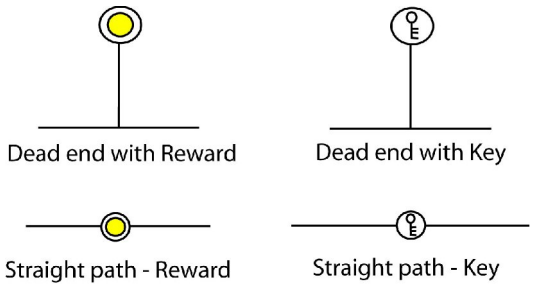

Figure 7.13 Keys and Rewards

Rewards by themselves rarely add to the path structures within the game, and are concerned with maintaining a player's motivation in terms of visual or auditory feedback. Rewards can be collected in most games. The most common reward in platform games is that of coins or

[276] Blast Theory, *Day of the Figurines* (www.blasttheory.co.uk, 2005).

rings, such as in *Super Mario Bros* or *Sonic the Hedgehog*[277]. The collection of coins increases the player's score and therefore acts as a reward for their collection. These rewards do not open up paths, but help motivate the player in their quest and have other enticements such as being able to beat their high-scores and compare reward status amongst other players.

Keys are about path structures and opening up further levels or parts of the game previously unexplored. They can work with rewards, for instance if a certain amount of points are required to complete a level, then coin rewards turn into a key once that level is reached. Keys can also be found by themselves, such as actual keys that open doors, unlock boundaries and let players continue. Keys are important in the creation of paths, whereas rewards often have little value in the movement through the game space. Both keys and rewards offer the player the chance to achieve goals, but in different ways. This can be seen in *Lego Batman* where the Robin character has to suck up a certain number of coloured blocks to put into a machine to create a new piece of architecture or weapon to open up a new area.[278] The collection of the coloured blocks acts as a reward, and a feedback loop of showing how to collect the correct puzzle pieces. The right number of coloured blocks then turns this reward into a key that can be used to open up a path. Rewards are about ludic ideas of goals and learning feedback loops, whereas keys are about paths and movement through the gamespace. As Frasca states, "a trait of simulational media is that it relies on rules: rules that can be manipulated, accepted, rejects and even contested".[279] Rewards remind us of the rules of the game and help us to learn those rules. The player may choose to accept the rewards, to gain high-scores and conform to the rules of the game, or carry on without them, as in the case of aberrant play. However, the collection of keys, usually in the correct order, is often vital to progressing through the game itself. A combination of a certain amount of rewards may be needed to turn these rewards into a key. Once keys have been discovered they can open up further parts of the game as seen through a discussion of gates.

7.9 Gates

The paths described so far in the morphology appear to be fairly free-flowing in terms of player experience with each path type evolving into another as various aporias within the game world are overcome. A common designed aporia within videogames is that of the gate, as depicted by a cross symbol in a dashed circle in Figure 7.14. This is a disruption of the

[277] *Sonic the Hedgehog* (Sega, 1991).
[278] *Lego Batman* (Travellers Tales:LucasArts, 2008).
[279] Gonzalo Frasca, "Simulation versus Narrative: Introduction to Ludology."

path in that it pauses the path temporarily whilst the player learns how to open the gate. These would be classed as a form of "soft boundary" by King and Krzywinska who state that, "soft boundaries act as temporary barriers but can be traversed under certain conditions (a key needed to open a door for example)"[280] Therefore, gates can only be opened with the use of a key, that is either found somewhere else previously within the game, such as the displaced key, or the around the same area of the gate, as in the use of an immediate key. Unlike bridges, the player cannot see the path beyond the gate. These gates increase the aporetic uncertainty of the player as they work out how to continue on their path, that in some cases may be disguised as a dead-end. The gated path and the dead-end are in fact very different components of the game path.

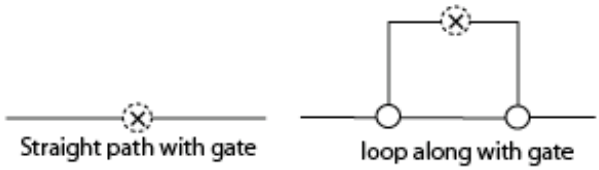

Figure 7.14 Gated paths

Gates are a way of confusing the player and act as a disguise for other path types. The concept of the gate can be linked to Björk and Holopainen's game design structures of "obstacles" and "inaccessible areas".[281] "Obstacles" are objects that "slow or block the player's progress in the game"[282] much like the gate, which aims to block the players progress as well as temporarily slow their action as they work through the aporetic uncertainty of solving the puzzle related to opening the gate. "Inaccessible areas" on the other hand are similar to the area behind the gate that the gate is hiding and is not viewable to the player until the gate is opened. Björk and Holopainen comment that these "inaccessible areas…provide players with an illusion that the Game World or Level is larger than it is".[283] In the same way that loop-alongs and loop-backs delay the player in their action as they try to work out where they are, the gate acts as a similar delay device. In delaying the action of the player as they find a way to destroy the boxes blocking their way, or finding the right key to open the door, the gate temporarily pauses the action in the search for the discovery of new paths. This heightened level of awareness of the player looking for clues as to how to solve

[280] King and Krzywinska, *Tomb Raiders and Space Invaders: Videogame Forms and Contexts*. 82.
[281] Björk and Holopainen, *Patterns in Game Design*. 77.
[282] Björk and Holopainen, *Patterns in Game Design*. 77.
[283] Björk and Holopainen, *Patterns in Game Design*. 77.

the puzzle of the unopened gate, may lead to more movement on behalf of the player. In turn this can make it feel like more paths have been explored than are actually covered over the period of time used searching for the answers.

This is also true of the way the gate disguises other path structures. Whereas a dead-end in a game may feel like an area where the player is unable to venture any further, it may soon become clear that through the finding of a key and unlocking of puzzles within the dead-end, a gate along the path may be unlocked and a new path is created. The gate is in fact disguising a loop-along that needed to be opened up through key rewards. The gate may also temporarily be disguising straight paths, loop-backs or blind turns all as dead-ends, yet once opened the hidden path type is revealed. This leads us to discuss the last path structure, the dead-end, and how in the world of videogames, its meaning has started to change.

7.10 Dead-Ends

> an event held recently at a historic hedge maze in southern England featured a walk at nightfall through the maze, with the pathway glowing in the light of some 50 or more…tea-lights set out in waxed paper cups. Clusters of light at the dead-ends of the maze drew the walkers like moths to the flame, sure that they were in sight of the goal, only to discover their folly.[284]

The dead-end is a path component found within the worldly maze and that of the videogame, yet the experiences of the player/walker may differ in the real world compared to the virtual, showing once again how videogames may have reworked our ideas of the maze.

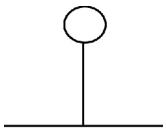

Figure 7.15 Dead Ends

The dead-end is the closing down of one path; it is the cul-de-sac within our everyday city streets, and in many ways is a sign we need to find a new direction to search for the way out. The dead end is an anomaly. It is neither a start to a journey or an end to a journey, nor is it a way of passing through, or a completely blocked passage. Walkers have to turn back on themselves within the dead-end, to go in another direction. It makes them aware of their search for something, and that this is not the way the search is heading. It signals choice, and

[284] Saward, *Magical Paths: Labyrinths and Mazes in the 21st Century*. 110.

prompts movement through the paradoxical denial of movement. It is recognised that once a dead-end is reached, the journey must continue in another direction. The dead-end of the real world maze will never take the walker somewhere new, it will never open up another path.

Whereas the dead-end in the real world maze is a place to try and avoid, a place of confusion/frustration as a sign of being on the wrong path, the dead end in the videogame signs various other purposes. There has become an expectation that the discovery of the dead-end in the videogame will open up some type of new experience for the player, be that finding a new object, or having to kill the enemies it is holding. As the player has become used to acknowledging dead-ends in other parts of the game where they experienced reward, an empty dead-end may be explored further in the hope of finding something new. This is through fear that the player is missing out on a vital clue or object needed to progress. This search due to a heightened awareness of aporetic uncertainty may continue for a while before the player re-traces their steps and carries on another path. Again, the dead-end acts as a delay device, forcing the re-treading of the same path, as it is the one path that cannot be opened to form another path. This is another strategy that makes players appear to be moving through a larger space than is actually available to them. The dead-end now becomes a place to be sought out, in the hope that it holds a key, a reward or can be opened up to form a whole new path structure, through the disguise of a gated path. It is no longer always feared, but it is more often than not still always a place of confusion. In encountering a dead-end the player may stumble across an object to help them later in the game. This often occurs in *Lego Indiana Jones*, where dead-ends may contain keys or extra items needed to unlock gates or provide special powers later in the game. The dead-end is a place of learning for the player. It is a sign of working out the purpose of the dead-end, whether it holds any useful items, or whether it can be used as a way of learning the controls or purposeful paths through a mental mapping and recognition of places and paths already experienced. One such way of learning about the use of objects in the game is through the placement of false objects.

7.11 False Objects

False objects include such things as boxes discarded in a room that, once broken open, reveal nothing. Other boxes may reveal rewards such as extra health or guns as in *Metal Gear Solid 2*, but the inclusion of false objects helps the players controller-interaction feedback loop of learning that pressing button X will in fact destroy or open a box, and that box has the possibility of containing a reward. The false object acts as a way of learning the mechanics of the game world in terms of player → controller → action feedback loops. This differs from

false rewards, which help players understand the rules and reward feedback loops of the game, yet do not lead to the opening of a path structure for a player or other such goal. These can be compared to Björk and Holopainen's "Illusionary Rewards" who use the example of *Super Mario Sunshine* in saying,

> Collecting all the stars is not required to complete the game, but in doing so, even after completing the goal of the game, can give players satisfaction, and be used to compare one's skill and dedication to the game with other players.[285]

Therefore the gaining of rewards can be linked to the cultural logic of play, as players keep a record of their achievements in order to discuss them with other players in a similar community.

False rewards help players to learn the rules of the game and gain high-score opportunities, but they do not open up any further opportunities for the player, in terms of new areas to be discovered. They also help the player to recognise areas they have completed and no longer offer the same reward that was once contained in that section of the game. This can be seen in games that offer the replaying of levels such as *Lego Indiana Jones*. In the free play mode, the player can go back through the level with their choice of characters to unlock previous rewards within the game not previously found in the games story mode. If goals have been unlocked in playing the story mode, once in free play the player is no longer able to unlock the same goal. Players can complete the same combination of actions, but no further reward will be available to them. However, they will be rewarded with the same auditory and visual effects as encountered on unlocking the previous lock, but no reward will emerge in that area, causing them to be presented with a false reward in its place. This continual searching for rewards and subsequent unlocking of goals and further paths within the game, can cause confusion on behalf of the player as they struggle to work out which rewards will open up new experiences, which will help them learn the mechanics of the game. This will give the player high-scores but no further progression in terms of path structures. It is through the placement of a combination of different objects that may start to cause a sense of aporetic uncertainty among players and the resulting anxiety from this sense of not opening up another path type.

As Huizinga states "The exceptional and special position of play is most tellingly illustrated by the fact that it loves to surround itself with an air of secrecy. Even in early childhood, play

[285] Björk and Holopainen, *Patterns in Game Design*. 77.

is enhanced by making a 'secret' out of it".[286] This quote notes the secrecy of play, the feeling of discovery that keeps players within the playworld. It is this search for the secrets of the game that is one aspect that keeps players continuing their search through the gameworld, striving to open up further paths. The cognitive process→decision/ indecision→action feedback loop continues until the correct action finally allows for a sense of epiphany. If previous actions are not unlocking the puzzle, the player may feel as though they are missing out on something vital. Previous paths may be re-walked, there may even be a sense that the wrong path was taken when a forked path was presented to the player, and they may try to go back to the original point of decision and take a new path. By understanding these individual path structures and how they can work together, models of player experience can start to be discussed in terms of learning, and motivations through the concept of the aporia.

7.12 Conclusion

This morphology starts to show how multicursal path structures can be broken down into maze-emes and discussed within the videogame. Instead of videogames being seen as a series of choices, it is now easier to understand each of these choices and how they relate to one another through each path structure and the objects found along each of these paths. Straight lines, loop-alongs, loop-backs and forked paths can all contain added objects such as keys or rewards to keep the player motivated and unlock further paths through the overcoming of related aporias. These paths may also be disguised by gates that need to be unlocked to reveal the type of path the player is on. Differentiating between dead-ends and gated paths makes clear distinctions as to how the player deals with each path scenario, be that re-treading the previous path, or finding the right key type. The experience of the gate helps us to understand one of many aporetic experiences that may be found within the game.

Understanding the different type of aporetic experiences that the player may encounter along the path is again vital to understanding the choices made available to the user in how they may be able to open up further paths within the game. In being able to understand how players start to work through the aporetic experiences they encounter through the feedback loops of aporetic uncertainty, the opening up of path structures can be seen in terms of ludic goals and narrative events. These, in turn, can motivate players through the scenarios of various game genres. The difference between the opening up of paths and the flow of game narrative as compared to ludic reward can again be seen through the discussions of rewards, false rewards and keys. Each provide the player with ways of learning the rules of the game,

[286] Huizinga, *Homo Ludens: A study of the play element in culture*. 12.

yet it is only the key that allows for the opening up of new path experiences. Paths allow for a personal account of player experience and how each player has their own learning curve within a game environment, therefore designed aporetic moments may not be solved or encountered in the same way by every player. Each path has distinct qualities to again help with the learning process of how the player may work through each situation. Separating bridges from gated paths shows how some puzzles may appear easier to solve than others. Whereas the bridge shows the player both sides of the path and that they need to be connected, the gate disguises the path type the player is experiencing. It is not until the gated path is unveiled through the solving of the gate, that the player can then understand where the newly revealed path may take them.

This chapter shows how videogames may have reworked our understanding of the maze. In breaking down the maze into separate maze-eme components, similarities and differences between the worldly maze and the videogame maze can be discussed. What is clear is how the paths of the videogames cannot be separated from those objects found along them and many path structures are re-defined through the videogame in understanding these associations. It is through discussion of the maze-like paths, their related aporias and how these add to the player experience that this thesis offers a contribution to knowledge through re-working and redefining previous concepts as well as adding new ones. Although this morphology may not be wholly transferable to all genres of videogames, its construction allows each path to be discussed and used separately. Therefore some games may only contain one or two path structures, whereas others may contain them all. The path itself allows us to feel the flow of the game through the player experience, the connecting passages the player moves through. Defining the paths of the game, helps in the understanding of those devices that seek to disrupt or break the path. This is where the discussion now leads us to warps, commonly used devices, used to break the path and transport the player elsewhere in the gameworld.

8. WARP DEVICES AND BREAKING THE PATH

8.1 Introduction

In the discussion of the maze-paths of the videogame, the concept of the warp is a key idea. In the previous chapters, various objects found along the path were discussed in terms of how they may affect the path for the player. Unlike other objects found along the path, the warp breaks the path temporarily and transports the player somewhere else. The warp as a construct of fiction is possible within the virtual worlds of the videogame, and can be seen as a device that changes the idea of the maze within gamespace. Therefore in researching and understanding types of path and track in the gameworld, the warp as a device along the path also needs to be investigated. This chapter outlines the characteristics of different types of warps within videogames and in doing so, adds another contribution to knowledge. The warp has yet to be discussed in its entirety, and understanding how the warp breaks the path in videogames, starts to define further relationships between paths and tracks in the gameworld. This chapter also builds on understanding how the warp can restructure temporal and narrative structures in various videogames and defines a vocabulary for various warp types that may be found along the paths of the gameworld.

There are various meanings of the word 'warp', from its use within weaving, its links with wormholes and concepts of space/time in physics, through to it being developed in science-fiction writing and the videogame.[287] The word warp can be traced to the Old English "wearp" which meaning "to throw". It is this etymology of the word warp and the association with throwing that can be seen as a common element in the discussion of various types of warp. The warp within weaving is the vertical line of thread within the woven pattern, with the weft being the threads that weave in and out of the warp threads. The warp in this instance is the basis of the weaving pattern as these are the first threads positioned before weaving, but it is this thread that becomes distorted by the weft thread as it weaves in and out. This notion of the warp being distorted, or distorting another object, is also a common theme when discussing various types of warp. The idea of the warp also features within discussion of blackholes and wormholes within physics, especially through ideas such as

[287] For details of the warp in weaving see Dorothy K. Burnham, *A Terminology: Warp & Weft* (London: Routledge, 1980). For details of the warp in physics see Jim Al-Khalili, *Black Holes, Wormholes and Time Machines* (London: Institute of Physics Publishing, 1999).

Einstein's theory of "Special Relativity".[288] Again, the warp is seen as a distortion of space and suggests ways in which time can be manipulated in different instances.

A common theme appears to be the fascination with ways of transporting ourselves to other areas through teleportation and warping throughout fictional stories, and more recently trying to link that fiction with scientific fact. Warp functions themselves exist in various novels and films such as the rabbit hole in *Alice in Wonderland* the TARDIS in *Doctor Who,* and even the bed in *Bedknobs and Broomsticks.*[289] Each instance of the warp sees the characters within such fictions use a device to transport them somewhere else. Through science fiction series such as *Star Trek,* the term warp speed is also used as a way of describing the way in which warps allow for a much quicker movement through space than is generally possible within the real world.[290] This is discussed by Benedikt (in Newman's *Videogames*) who states that

> the ancient worlds of magic, myth and legend to which cyberspace is heir as well as the modern worlds of fantasy fiction, movies and cartoons are replete with violations of the logic of everyday space and time: disappearance, underworlds, phantoms, warp speed travels, mirrors and doors to alternate worlds, zero gravity…[291]

These ideas of the warp are part of our cultural imaginary and indicate how we understand time and space differently within these fictional environments. Each instance of the warp acts as a device for changing time, space and narrative elements within fiction, and through its presence in various media types, we can recognise the warp as a common cultural artefact. Therefore it is only natural that this device of fiction has been recreated within the videogame, where once again constructions of time, narrative and play can be understood in various ways. Warps are a violation of the continuity of the real world, and it is accepted that they are not part of our quotidian lives. However, the use of the warp in fictional media is accepted as a magical device. *Snakes and Ladders* is a traditional board game that uses warp devices, in the form of the snakes and ladder functions within the game.[292] The player is transported forwards or backwards along different paths, breaking the original linear route through the game-board. The use of the warp within the videogame is yet another progression from more traditional game ideas to virtual spaces, as the realms of the technology allow for the manipulation of time and space.

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[288] Al-Khalili, *Black Holes, Wormholes and Time Machines.*
[289] See Lewis Carroll, *Alice's Adventures in Wonderland*. (London:Penguin, 1865), *Doctor Who* (BBC, 1963) and Robert Stevenson, *Bedknobs and Broomsticks.* 1971
[290] Gene Roddenberry, *Star Trek,* 1966
[291] James Newman, *Videogames*. 2004, London: Routledge. 111.
[292] Milton Bradley, *Snakes and Ladders* (USA, 1943).

8.2 Warps as Devices

If we understand the warp as being a device along a path, we can start to see how the warp functions in separate ways to other objects discussed within the last chapter. The term device can be understood as either a permanent object on the landscape or a portable object found to be used when required by the player. It can be found along any of the paths previously mentioned in the morphology, and exists much like other objects found along the path to be used by the player. Whereas I have previously commented on the tunnels within *Super Mario Bros'* being linked to "loop-alongs"[293] within the game, through developing ideas surrounding the warp and recognising it as a separate device it is now clear that the tunnels act as warp devices forcing the player in one direction. So why are these tunnels warps and not part of loop-along path systems within the gameworld?

Once the player's avatar is in the tunnel, it is no longer able to navigate along the path. The view within the tunnel is not seen, only the path before the tunnel and the path after the tunnel are seen by the player. The player's avatar has been transported from one path of the game to another, and has no choice in being able to freely move back to the original path. If the tunnel allowed for free-flowing movement back and forth, then this could be seen as a loop along system. Henry Jenkins discusses warps in relation to de Certeau's bridges, stating that, "a related feature of the games are warp zones-secret passages that, like de Certeau's bridges, accelerate one's movement through the narrative geography and bring two or more worlds together".[294] Although the warp does bridge together two separate gameworlds, it differs as a device from those bridges already mentioned in the morphology of maze-paths, and will therefore not be referred to using the same term. Bridges within the structure of a path involve puzzles to be solved in trying to connect the paths with a bridge, and the player has a clear view of both their start and end point. The bridge therefore connects the fluidity of the path, whereas the warp breaks this fluidity, transporting the player from one path to another.

We can summarise these statements about what constitutes a warp in the following ways:

1. Warps break the fluidity of the path. The player is taken from one path to a separate path. Even if the new path can be seen, the original path is still broken in order to reach it.

[293] Alison Gazzard, "*Moving Through Game Space: The Paths of the Videogame*", paper presented at *GDTW2008* (Liverpool John Moores University: Liverpool, UK, 2008).
[294] Fuller and Jenkins, "Nintendo and New World Travel Writing: A Dialogue."

2. The navigational control of the player is taken away whilst in the warp. The player becomes viewer for the time they are in the warp.
3. Time and narrative structures can change whilst in, or after the warp, as the fluidity of the previous path has been broken.

In breaking the player's original path within the game, and removing navigational control, the experience of the player's avatar changes from being on paths within the gamespace to being on tracks. Where tracks were discussed within the previous chapter as allowing player's to have some control whilst their avatar is moving along a track with active volition, tracks can also be discussed as having suspended volition, as shown in Figure 8.1. Tracks that have what I term suspended volition, take away the control of the player and their avatar whilst it is on the track. Tracks with suspended volition are those that appear whilst the player's avatar is experiencing the effects of a warp device. Therefore any discussions related to tracks within this chapter (unless otherwise stated) will be those with suspended volition.

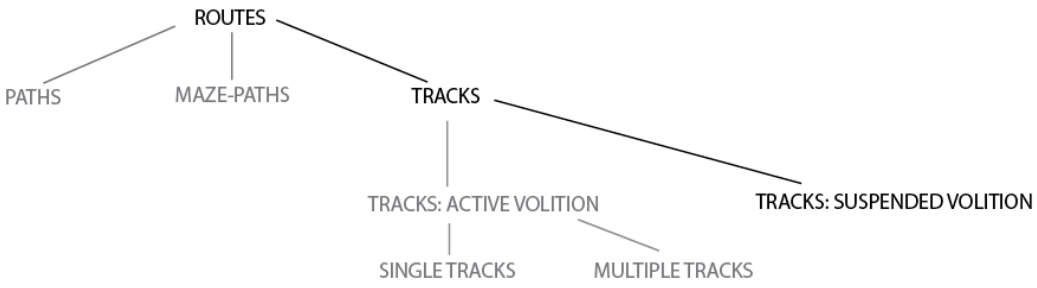

Figure 8.1 Tracks with suspended volition.

As well as breaking the path, and changing paths to tracks, the structuring of time can also be altered whilst in, or after the warp is experienced. Time can be linked to a restructuring of narrative and play elements and how the narrative of the game is experienced. Warps can distort time within the game, either by speeding up the time taken to get from one level to another, or the ability to rewind or pause time in order to solve various puzzles. The discussion of time, and how it is constructed within the gameworld, is vital to how players experience the warp and other temporal or narrative elements within the videogame.

8.3 Revisiting Time in Videogames

In Chapter 3, it was made clear that the relationship of the path and the player in this thesis is seen as a one-to-one projection between Juul's "play time" to "fictional time". However, it can be seen that the warp distorts the path in such as way that the one-to-one mapping of player to path can be broken, and the warp device and related sequences are used in such a way as to break this fluidity of the path. It may be that the warp continues the mapping of one-to-one "play time" to "fictional time", yet the player has no control over where the warp takes their avatar. It may also be the case that this one-to-one mapping is broken, and time is sped up or slowed down during the warp. Narrative events may be re-ordered during the warp, playing with "fictional time" or cause and effect sequences in another way entirely.

It is through understanding different mappings of time existing in different instances in the virtual game world as opposed to that of the quotidian, that players can accept the possibility of warps within the game. By playing in a virtual world, natural world occurrences do not have to be obeyed. The laws of physics can be changed so that moving through walls, skipping parts of levels, accidentally falling down a tube and ending up in a new location, or normally sequential narrative structures being re-ordered, can all be accomplished within the game setting. As Huizinga states,

> Play is distinct from 'ordinary' life both as to locality and duration. This is the third main characteristic of play: its secludedness, its limitedness. It is 'played out' within certain limits of time and place. It contains its own course and meaning.[295]

The act of play sets the gameworld apart from that of the real world. Players can move through spaces in a way not possible in the real world, and discover different ways of travelling through the gamespace. It is finding these newly discovered parts of the game that can be the thrill of playing, and it is through the unique understanding of the "magic circle" of play space that the warp function has been incorporated into games. This relates to games being constructed of their own rules within the virtual space and is re-iterated by Zagal et al, who state:

> Computer games are spatial – most games convey a notion of place to the player, whose participation in the game is within the boundaries of a virtual world (Murray, 1997). This world, although different from the physical world we inhabit, is still subject to its own rules and constraints; it has an internal consistency that allows the player to recognize it as a world (Juul, 2004).[296]

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[295] Huizinga, *Homo Ludens: A study of the play element in culture*,. 9.
[296] Zagal, Fernandez-Vara and Mateas, "Rounds, Levels and Waves: The Early Evolution of Gameplay Segmentation."

Prince of Persia: Sands of Time is a key example of a videogame re-working the rules and altering time through the player's discovery of devices.[297] The game contains a special trigger for players to rewind time at certain points within the game, allowing them to stop themselves falling to their deaths. Barry Atkins discusses this unique use of time in his chapter, "Time in Prince of Persia: Sand of Time"[298]. Although Atkins states the rewind function is no different to save/reload sequences available in many games, he does make this distinction,

> That the player who has failed this challenge is allowed to try again comes as no great surprise…But Sands of Time accommodates something close to the save/reload *inside* the game-space, and *within* the game's internal logic.[299]

The capacity to rewind the game indicates a warp sequence within the level for the player. This sequence can be seen as part puzzle and part spatial navigation. It allows the player's avatar an opportunity to avoid (or delay) death. This acts as part of the puzzle to be solved, using the player's ability/knowledge of the game to judge when to use the trigger. At the same time, the player can change the timing of the game, therefore changing the narrative sequence. The game changes the narrative for the player to try and succeed at not dying the second time round. Previous events are shown in a fraction of the time that they were once played through the act of rewinding. All the time the player remains in a warp until the rewind sequence is complete and full navigational control along the path can be regained. So not only does the warp distort our perspective of time within the gameworld, it can also manipulate the narrative experience, whether intentionally or by chance. Warps change the relationship of how the player negotiates maze-paths within the videogame. A discussion of warps in more detail allows for an understanding of how our idea of maze within videogames may have shifted, through this fictive virtual experience. Understanding the warp also leads to a discussion of the various instances of the warp, whether they are built in puzzles that are to be solved as part of the game, or hidden away extras as found by the aberrant player.

8.4 Categories of Warp

> Super Mario Bros…offer(s) warp zones for players to skip levels entirely or to travel down a tunnel to an area without enemies and filled with gold coins to then travel back up a tunnel to the regular level which has been progressed spatially.[300]

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[297] *Prince of Persia: Sands of Time* (Ubisoft, 2003).
[298] Barry Atkins, "Time in Prince of Persia: Sands of Time", in *Videogame, Player, Text* , ed. Barry Aktins and Tanya Krzywinska (Manchester: Manchester University Press, 2007), 231.
[299] Atkins, "Time in Prince of Persia: Sands of Time."
[300] Taylor, "Labyrinths, Mazes, Gardens, and Sandboxes: Game Space Metaphors."

Super Mario Bros offers the player two distinct categories of warp: those warps found by the aberrant player, or those overtly placed within the gameworld. Each instance of the warp offers similar yet different experiences and it is these distinctions that will now be explored as an examination of the various characteristics of the warp in videogames. Warps are used as designed features within many games, and have also been discussed using terms such as portals, teleporters, or warp zones. Rollings and Adams discuss the use of "Teleporters" within videogames stating that,

> Teleporters can further complicate matters by not always working the same way, teleporting the player to one place the first time they are used, but to somewhere else the second time, and so on. They can also be one-way or two-way, teleporting players somewhere with no way to get back, or allowing them to teleport again.[301]

What Rollins and Adams term as a "teleport" can also be seen as a warp. The two features perform the same function, breaking the players path and taking them somewhere new. Rollings and Adams comments about teleports raise questions apparent in the design of warps within videogames and the player's experience of them. Not every warp encountered acts in the same way. The deliberately installed warp pipes of *Super Mario Bros* give the player a different experience from the warps used within the game *Portal*[302]. Although both temporarily break the path, and cause the player to have little control over the place they are taken to, each warp type has its separate qualities. This can be seen through Jenkins discussion of hidden or secret paths within various videogames, and how these differ from what he terms the "pre-programmed pathways" of the game. He states, "'Secret codes', 'Easter eggs' and 'Warp Zones' function in digital space like secret paths do in physical space and are eagerly sought by gamers who want to go places and see things other can't find".[303] For Jenkins, the "warp zone" is seen as a place found by what I have previously termed the aberrant player. These warps exists in a similar category to what Jenkins terms "secret codes" and "Easter eggs", those hidden "added extras" found by players exploring outside of the game rules in search of the greater algorithm. This, in itself, sets these types of warp within a different category to those that are built in as part of the deliberately designed game rules. It raises further questions about the distinctions between various types of warp function within videogames.

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[301] Rollings and Adams, *Andrew Rollings and Ernest Adams on Game Design*, 231.
[302] *Portal* (Valve Corporation, 2007).
[303] Henry Jenkins, "Complete Freedom of Movement; Videogames as Gendered Play Spaces", in *The Game Design Reader* , ed. Katie Salen and Eric Zimmerman (Massachusetts: MIT Press, 2006), 340.

As Aarseth writes, “a common motive in many, if not most, computer games is the teleporter, a means to move instantly from one point in the gameworld to another”.[304] Aarseth goes on to discuss how this relates back to MUDs (multi-user dungeons/domains). Although MUD administrators tried to keep rooms “topologically correct”, the most common way to move between rooms was by teleporting rather than moving through each individual room. Ease of movement in this way was due to players not having a graphical representation of the gameworld, only a text-based description. This meant that moving between rooms easily was not always questioned by the player, although drawing maps to represent the descriptions may have caused some inconsistencies in terms of the game geography. However, now that videogames present players with displayed avatars and movement through three-dimensional space, the various uses and types of warps need further examination. It is at this stage that I put warps into various categories. The two main categories can be seen as aporetic warps and inadvertent warps. Whereas aporetic warps are those warps deliberately installed into the puzzle sequences and solutions of the game, the inadvertent warp is often found by the aberrant player. Through a discussion of these new terms, the various ways of breaking the path will be categorised further. Categorising warps in this way is an extension of the morphology of paths and another contribution to knowledge of this thesis. Whereas the morphology exists to show how paths flow into each other, these categories of warps can be seen as a typology of devices seeking to break the path.

8.5 Aporetic Warps

Warps can be included within videogames as part of the puzzle to be solved. The word puzzle here is not used in relation to puzzle games as such, but as a term to describe a problem that needs to be solved within the game. The term aporetic warp has been chosen to link to ideas of the aporetic experience and overcoming the aporia. Once again, these types of warp are parts of a puzzle to be overcome. The aporetic warp may manifest itself in various ways. The puzzle may be how to activate the warp, or how the player positions the warp to transport them to the right location, or which warp to choose when multiple warp zones are found. As previously discussed, not every warp encountered within the videogame acts in the same way. The deliberately installed warp pipes of *Super Mario Bros* give the player a different experience to the warps used with the game *Portal*. Although both temporarily break the path, and cause the player to have little control over the place they are transported to, each warp has distinct qualities. These qualities include how the warp is presented to the player, its use, the effect of the warp in terms of temporal, narrative and gameplay elements, how long

[304] Aarseth, “Allegories of Space: The Question of Spatiality in Computer Games.”

the warp lasts and where the warp takes the player to. By categorising different types of warp it is possible to see how these devices along the path affect the player's experience of the maze-path or track.

Taking into account various characteristics associated with warps, we can categorise aporetic warps into three distinct types. These are:

1. Jump Warps.
2. Return Warps.
3. Portals.

These are named through the effect of the warp destination on the player, and how the warp can be used. In order to understand each warp, a more detailed discussion of their characteristics and uses needs to be had.

8.6 Jump Warps

Jumps warps can be categorised as being unidirectional, in that the warp only works one way. This is linked to the warp being a use-once type of warp, meaning once used the player will have to find another jump warp or other type of warp in order to warp again or return to their previous path. Jumps can be further separated into visible jumps and aleatoric jumps.

Visible Jumps are defined as the player being able to see both the start and end point of the jump warp. Visible jumps can be seen in the warps found in *Toki Tori*[305] as shown in Figure 8.2. This is a puzzle game where the player has a toolbox of items they can use to fill in the paths of the game, such as bridges, or items to jump to another part of the same level by using a warp. The warp is visible to the player as the level is two-dimensional and exists on one screen, therefore the start and end points are both shown and there is no surprise as to where the player will warp to. The player can determine the end point of the warp. This is a very different experience to that of the aleatoric jump. These jumps are defined as the player understanding where the start point of the warp is, but the end point cannot be seen as it is a new path determined by the games system. These jumps have been termed as such by using Caillois' use of "alea", defined as "games of chance".[306] As the end path is hidden from the player, whether found in the 2D or 3D game, the player takes a risk as to the destination they will warp to. These types of warp can be seen in the inadvertent warps of *Super Mario Bros*

[305] *Toki Tori*, (Two Tribes B.V, Capcom, 2008).
[306] Caillois, *Man, Play and Games*. 36.

where the player has no way of knowing where each of the warp pipes presented to them will take their avatar. By choosing one pipe over the others, the players risks ending up somewhere that may in fact hinder their process, rather than progress it, but it is through the aleatoric jump that the players can learn to differentiate between each warp device and where it will take them once used.

Figure 8.2 Warp device in *Toki Tori* (depicted by outline below avatar)
Toki Tori (Two Tribes B.V, Capcom, 2008)

Jump warps can happen within the same level, so the player warps to a previous part of a level, or a place slightly further along. The warp could also take them to a new level altogether, therefore the player has an added challenge of new paths to experience and different types of aporia to overcome. Jumps can in fact turn out to be return warps, but this only becomes obvious once the player moves one way and then realises she can warp back again. It is through this discovery and learning process that warps can change in meaning and definition.

8.7 Return Warps

Return warps differ to jump warps in that they allow the player's avatar to move back through the warp again, making the warp bidirectional instead of unidirectional. This again starts to differentiate between two different types of return warp, those that allow the player's avatar to warp back again to their original point, and those that then create a new warp that takes the player's avatar to another place. These can be seen as 'return to previous' and 'return to other' warps respectively. In the second instance, the 'return to other' warp creates more confusion for the player as they may originally believe that they will be warped back to

the original path they first warped from. Transporting the player's avatar to another path disrupts the original game path and the player's experience further. These types of warps are probably less common within videogames as they disrupt the flow of moving along the path and may lead to too much aporetic uncertainty on behalf of the player. The more common 'return to previous' warp can be extremely useful for players wanting to move around a gamespace more quickly. This can be seen in the game *Banjo Kazooie: Nuts & Bolts*.[307] Here the player can warp between the central area of the game back and forth to various mini-games that can be found outside the central game world. The town area of the game is the focal meeting point of the game and is a place where the player's avatar can upload puzzle pieces and gain advice from other non-player characters. Although it is the core area of the game, most of the game action occurs outside of this area as the player's avatar is warped to other mini-worlds in order to complete smaller games to gain puzzles and rewards. As these puzzle pieces have to be returned to the central town of the game, return warps are built into the game design to allow the players to return here more easily and deposit their rewards. The warp makes travel from different parts of the game quicker and may act as a puzzle in itself, for the player has to remember which parts of the world are unlocked and can be warped to and parts remaining still need to be opened. The return warp in itself can act as a reward for allowing the player to return back to their starting area, and may be a jump warp that can be unlocked in order to be turned into a return warp once a certain task has been completed.

Much like the gated paths discussed in the morphology, warps themselves may also be conditional in terms of having to find a key to unlock them. Whereas the start point of the warp may be conditional in the first place for the warp function to be available to the player, the warp may also be conditional once the player's avatar has moved through it. The original unidirectional 'jump warp' may require unlocking, through the completion of a set of tasks, or the finding of a key in order to turn it into a return warp. This too can make warps a new type of aporia to be overcome, as the player may warp to a place in the game to gain extra skills and pick up new items, but in doing so may also have to warp back to their original path once these items have been collected or objectives completed. Learning how to unlock the jump warp in order to return can be another aporetic experience that is built into the game world.

Although some warp types have their own unique properties, it is possible for warp characteristics to exist in more than one warp type. Whereas some warps only allow the

[307] *Banjo Kazooie: Nuts & Bolts* (Rare, Mircosoft Game Studios, 2008).

player's avatar to move in one direction, other warps have shared properties. Return warps may be freely open within certain types of games, whereas other games may have return warps that are conditional in that it may need a key to activate it. This flexibility can also be seen through the last type of warp that I have defined, that of the portal.

8.8 Portals

In his discussion of portals and teleporters in both videogames and MUDs, Newman uses the term portal to discuss warp systems. He states that,

> Turok: Dinosaur Hunter uses a similarly non-linear teleport system. An array of portals non-spatially link the central Hub to individual levels. In a style popularised through science fiction such as Star Trek, the player walks through the appropriate portal in the Hub whereupon they appear at their chosen level.[308]

The portal is once again a special type of warp and differs from jump or return warps. What I define as portals are unique as they are probably the most flexible type of warp available. They are similar to return warps in that they allow for movement between start and end points. However, they differ from return warps in that the player has full visibility of both the start and end point of the warp before they choose to accept the portal. The portal acts in many ways as the truly visible warp, allowing the player to see where they are warping too, and then giving them slightly more freedom as to whether they choose to accept it or not.

The game *Portal* is built around this concept of portal warps.[309] This game shows how once again the properties associated with this type of warp are not necessarily fixed. At the beginning of *Portal* the player learns how the portal warp works, allowing them to move from one path to another by using a pre-determined start point to the warp, and positioning their own end point. As the player advances through the first few tasks of the game, they are then given greater freedom of being able to create their own start and end points to each warp portal. This allows the player to cancel these choices and create new ones by seeing where the portals will lead them. The game challenges the player to place the portals in the correct position in order to solve puzzles along different paths, making the paths safe before the player's avatar warps to the new path and carries on its journey.

It is a game based around the breaking of the path, although not necessarily the breaking of the one-to-one mapping of the player's relationship with their avatar to the path as can be

[308] Newman, *Videogames*. 121.
[309] *Portal* (Valve Corporation, 2007).

seen in the previous warp examples. As the portal warp allows for quick movement between different paths, the relationship between the player and the path is not always lost as the track of the warp is instant. However, time does change whilst using a portal warp as although the one-to-one mapping of “play time” to “fictional time” may not change, the portal warp speeds up access to different rooms. Therefore, in contrast to using paths to get between point A and point B by going through sections x, y and z, the portal warp allows for instant access between these two destinations, cutting out the sections in-between. This changes the relationship with the temporal and narrative constructs of the gameworld through the instant breaking of path types and the recreation of new ones. The constant warping between different paths keeps the players momentum through the game, and allows different paths to be used in new ways as the player experiences seemingly non-sequential combinations. The manipulation of the path and the moving between different paths changes the player’s experience of the paths they are encountering. This allows the same room to be experienced and viewed from different positions depending on the new path the player’s avatar is then warped to. Creating start and end points to the portal can also change the viewing position of the avatar. At certain points within the game, it is possible to position a portal so that on walking past it, the player’s avatar is viewed from a far, even though the player is playing from a first-person perspective, as shown in Figure 8.3.

Figure 8.3 Player’s avatar viewed through a warp in *Portal*
Portal (Valve Corporation, 2007)

8.9 Swap Warps

Whereas the above mentioned warp types can be included in multiplayer games, swap warps are unique to the multiplayer experience. They exist as a way of exchanging paths with

another player in the game. This can be seen most easily within the *Mario Party* games.[310] *Mario Party* exists as a virtual board game, with multiple players taking it in turns to throw the onscreen dice and see their avatars move the designated amount of steps around the screen. At certain intervals, the player can choose their direction in order to get their avatar to the star on the board before the other players. As soon as one player has gained the star it changes position. The goal of the game then changes and players again compete to get their avatars to the new star position first. During the game the players may pick up special rewards in the forms of balls or sweets. These can allow such things as increasing the amount of dice rolls the player has, slowing down the spinning of the dice, and swap places with other player characters on the board. Swapping positions with other players can be defined as a swap warp. The player initiating the warp is then subject to a random process of choosing the player to swap with by using a spinning wheel of fortune device. Therefore the player's avatar may swap with another character that is further away from the star than they originally were, or they may move closer to it. This random selection process makes the warp a risk in terms of the new path the player's avatar will move to. In breaking their original path, the player also has to re-orient herself within the game world as to where she now needs to go in order to complete the goals of the game.

Swap warps are usually unidirectional, therefore once used the player cannot return their avatar to its original position. If the player's avatar is allowed to warp again, it will do so to another path of the game to the one they originally started from. These types of warps create another puzzle for the player and an added risk factor as to whether the warp will be worthwhile in accepting as it may hinder their progress. Other tactics within multiplayer games can also be used to disrupt the gameplay. It can often occur within multiplayer scenarios that players pause the game action when their opponents are winning, especially within car racing games. This pause, although only a temporary break in the action, acts as a distraction and breaks the flow of the game and the current path structure for all the players. Seeking to disrupt the game in this way can be seen as an action of the disruptive aberrant player, and where the focus of this discussion now shifts. In opposition to aporetic warps deliberately installed into the game, there are inadvertent warps, those to be found by the aberrant player.

[310] *Mario Party* (Nintendo, 1998).

8.10 Inadvertent Warps

The inadvertent warp is not deliberately installed as part of the original game design, it is an added extra to be found. However, sometimes inadvertent warps are deliberately installed to be discovered by the aberrant player straying from the designed paths of the game. At other times they may be bugs in the system such as the “minus level” of *Super Mario Bros*. Anyone playing the original *Super Mario Bros* in the 1980s will remember rumours of a “minus level”. This is reached through finding a warp zone in a glitch at the end of level 1-2, as shown in Figure 8.4. By finding the glitch and going through a wall in the game, the player can then go down a warp pipe within the game to “level -1” or the “minus level”. This warp is unidirectional, and on encountering the warp at the end of the level, the player starts the level again. The “minus level” found is actually the same as levels 2-2 and 7-2 further on within the game that the player has yet to find. Therefore, this warp glitch changes the temporal and narrative structure of the game, taking the player to new levels yet to be opened and explored in the conventional way of unlocking the level sequentially by completing tasks in the correct order.

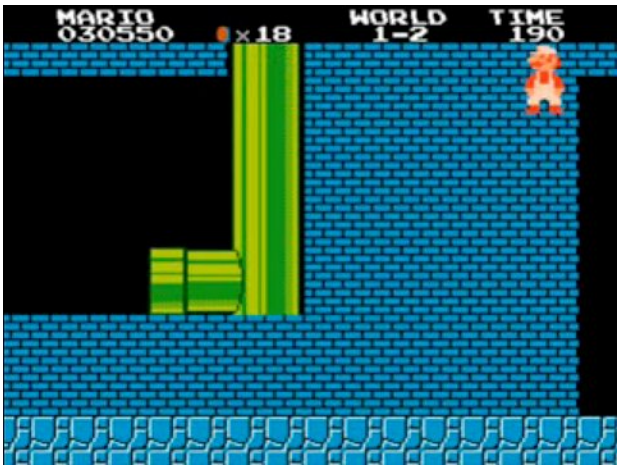

Figure 8.4 Glitch in *Super Mario Bros.*
Super Mario Bros. (Nintendo, 1985)

By warping to further levels (or copies of further levels, as in the case of *Super Mario Bros*), the player is not experiencing the usual sequence of learning and the related outcomes. Through playing with time and jumping ahead within the game, the player has no longer experienced the levels in between that help with the learning process of the game. This in some ways can be seen as cheating, by being able to glimpse at what is yet to come in the game, or completing the game by warping to levels nearer the end of the game without having to complete other ones previously. This cheating may backfire as the player struggles

to understand how to tackle higher levels as the learning involved in previously levels has been skipped. The player no longer has access to the mastery involved in progressing through the usual sequence and learning how to overcome path structures, the aporetic experiences, and the related uncertainty in earlier levels. Being able to skip parts of the game in this way does allow the player to complete the game in a quicker time, and it is this aspect that can be used whilst competing with other people in the completion of games. Time is often a factor when comparing how people have played game. Some players like to complete games in the quickest time possible, thus giving them a sense of achievement or an illusion of achievement. Once again, this is part of the cultural logic of the game, allowing the player to tell the game community about these achievements and see how these achievements may rank with other players of the same game.

Warps distort time in videogames further, allowing players to progress more quickly, therefore finding an inadvertent warp may help with completing the game in a faster time. On the downside, the inadvertent warp may trap the player's avatar, and its discovery does not lead to quicker completion but further exploration or having to restart the game in order to continue. As inadvertent warps found within videogames tend to be unidirectional, by finding glitches the player may be warped to a new area but it is one not connected with the rest of the game world. As old paths fade away, new ones are discovered, but these new paths are no longer connected to the paths of the original game. If there is no new warp to be found, the player may remain trapped within the dead-end of the newly found area. The only way to escape is to reset the game and start again, in the hope that the warp will not be encountered again unless it is desired. In starting again the previous sequential, temporal and narrative elements of the original game can be resumed. The unidirectional nature of inadvertent warps tends to be due to the fact that they are accidents of code, bugs that were never meant to be legitimately found. The experience of these warps is markedly different to those that are deliberately installed within the game design. Within discussions of warps within multiplayer games, the issue of pausing the game to advantage one player over others was raised. This act of pausing can be seen as a form of cheating, as the disruption can frustrate other players, but it does raise the question of whether pausing in itself, in a single-player or multiplayer game, can be seen as a warp?

8.11 Pausing and Re-generation

Using the definitions of a warp as a device that breaks the fluidity of the path, whilst not allowing the player any navigational control, the pause and re-generation sequence are both, by definition, types of warp. The pause is a warp found within many contemporary videogames. It gives the player a sense of empowerment within the represented world. It can act as a restful pause, a distraction, or a way of thinking through the next game puzzle without the fear of dying immediately. The use of the pause is a deliberate action and therefore a deliberate warp for the player. It breaks the path of the gameplay temporarily, and therefore the time "play time" of the gameworld is affected. The death→regeneration sequence of the game is one that may not be avoided, unlike the deliberate action of the pause warp. These sequences are again warps within the game, as through dying the path of the game is broken and the player has no navigational control in returning to it. It is also often the case that the player may then have to restart the game at an earlier point on the path to the one at which their avatar died. This may be a previous save point, or it may mean starting the level over again.

The use of save points is in itself, a way of a player creating their own portal warp to go back to. Some games offer save points that can be defined by the player, whereas other games have an automatic save feature. It could be seen that player defined save points act as portals whereas automatic save point can be related to jump warps. Games that automatically save mean that the player may not necessarily choose where they restart from once their avatar has lost its life and has to begin again. In comparison those save points defined by the player can be used strategically to maximise the chance of the player succeeding after the first avatar death. As Atkins quotes from the manual of *Doom 3*, "Save and save often…Unless your health is really low".[311]

The save function can be used strategically as the players' own portal to a path in the game they feel more accomplished with. Some games offer cut-scenes as part of death→regeneration sequences, with parts of narrative shown in the death sequence, again showing how warps can be used to deal with narrative elements with respect to time. In games such as *GTAIV* the player, once dead, is always restarted at a hospital within the city, filling in parts of the narrative without having to show a cut-scene. It is assumed the hospital has treated the player's avatar, and they are now able to continue within the game. This jump warp between point of death, and the place where the player is restarted from offers narrative

[311] Barry Atkins, "Time in Prince of Persia: Sands of Time." 247.

through the signs of place, and the placement of the player on a different path. As the cut-scene also offers this type of spatial narrative warping, is it then possible to discuss these gaps within the interactive navigation of the gameworld in the same way as the warps described above?

8.12 Cut-scenes as Special Case Warps?

"Cut-scenes act as bridges between levels or mission to tie in game narrative. In this instance bridges piece together temporal elements within the game to help aid narrative and show how the game is to progress".[312] Whereas I had previously commented on cut-scenes as being likened to bridges within the path structures of games, I have now identified two types of cut-scenes available to players. Some cut-scenes do act as bridges to piece together parts of narrative within different game worlds whilst the player remains on the same path. This can be seen in mission-based games such as *GTAIV* and *Left 4 Dead*. On the completion of missions within these games, the player is greeted with a cut-scene such as the stats of the mission the player has just completed, as shown in *Left 4 Dead* where the player is shown how well they did within the mission.[313] The player may also have a cut-scene showing further narrative within the game, either filling in narrative after the completion of a mission, or outlining a new mission such as in *GTAIV*. In these cases, the cut-scene acts as a narrative device, showing the player their successes, and/or filling in extra story elements within the game. These cut-scenes do bridge one mission to another by filling in these extra details, yet they do not break the path, as once the cut-scene is complete, the player remains on the same path they were on before the cut-scene started. But what happens when the cut-scene disrupts the path? Is this still a bridge, or by definition do these cut-scenes now become narrative warps?

In many level-based games, cut-scenes can denote the completion of one level and the beginning of a new one. In this case, the previous path of the level is broken, causing these cut-scenes to act as level warps. The old path is now left behind and the player's avatar is warped to a new level faced with a new set of paths to overcome and understand after the cut-scene has taken place. The cut-scene in this respect can be seen as a level-based, 'jump warp' moving the gameplay in one direction. Players have no control over where their avatar is taken to after the cut-scene and whilst in the cut-scene navigation is restricted. As previously mentioned in respect to portal warps, cut-scenes can also change player:avatar relationships.

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[312] Gazzard, "Moving Through Game Space: The Paths of the Videogame."
[313] *Left 4 Dead* (Valve Corporation, 2008).

Therefore, whilst in these warps, players can witness their avatar in third person when it was once viewed from a first-person perspective. This highlights how the player becomes viewer whilst in the warp as the parameters of the game are often changed. The paths of the game are also broken and new paths and aporetic experiences linked to these paths have to be re-learned and built upon from previous paths encountered in the game.

Patrick Crogan comments on the cut-scene by stating that, "Cut-scenes are a common convention in a number of computer game genres…in which gameplay progresses from one scenario and locale to another or from one level to the next".[314] Whereas Crogan does not refer to the cut-scene as a warp, level-based cut-scenes can be seen to separate the paths of the game. In doing so, the player does not always have control over the avatar's movement and actions. During these types of cut-scene the player's avatar experiences movement along tracks with suspended volition rather than paths. The use of tracks in this instance also highlights how the warp is used to manipulate the player's experience of time within the game world. The cut-scene allows for the passing of time within videogames and, like the rewinding of time in *Prince of Persia: The Sands of Time*, the cut-scene allows for the fast-forwarding of time without the player having to explore more of the gameworld. It also acts as a way of allowing the game to load whilst the player is watching the extra narrative provided by the cut-scene. Cut-scenes where the player warps to a new level allow for a way of setting the scene for the new area the player is about to experience and prepares them for a change within the new paths laid out ahead of them.

Juul highlights the use of the cut-scene as a temporal device within the game and how the player has little or no navigational control for the duration of the cut-scene:

> Cut-scenes are not a parallel time or an extra level, but a different way of projecting fictional time. They do not by themselves modify the game state – this is why they can usually be skipped and why the user cannot do anything during a cut-scene.[315]

Juul's mapping of "fictional time" to "play time" during a cut-scene is shown in Figure 8.5. It shows how the mapping can change during cut-scenes as parts of the narrative may be filled in during shorter time sequences, rather than using a one-to-one mapping of "fictional time" to "play time", as found elsewhere in the same game. This once again re-iterates the

[314] Patrick Crogan, "Gametime: History, Narrative and Temporarilty in Combat Flight Simulator 2", in *The Video Game Theory Reader* , ed. Mark J.P. Wolf and Bernard Perron (London: Routledge, 2003), 281.
[315] Juul, *Half-Real: Video Games between Real Rules and Fictional Worlds*, 145.

difference of the warp device in relation to the path. The path provides the player with a way to move through the game space and manipulate their actions, whereas the warp changes the path into a track from A to B, either as part of a puzzle or as a way of filling in narrative. Whilst in the warp sequence, the player has no control of where they are going, and the player's avatar is subject to the tracks of the warp. However, once out of the warp and on a new path of the game, the players have to start recognising the new paths they are faced with and the experiences they may encounter on those paths separate from the ones they were once on. Therefore, level-based warps such as these can be used to increase challenges between levels. Each new level contains new paths for the player to learn and try to overcome.

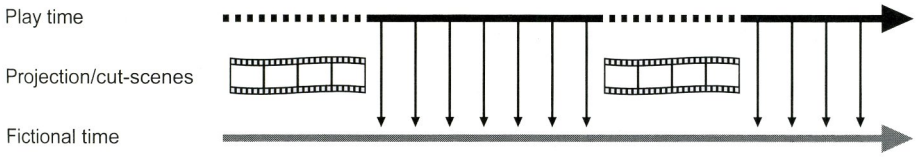

Figure 8.5 Alternation between play time being a prop for fictional time and fictional time being narrated by cut-scenes.
Juul, *Half-Real: Video Games between Real Rules and Fictional Worlds,* 145.

8.13 Conclusion

The warp is vital in the discussion of the path within videogames. The warp allows the user to play with temporal, narrative and puzzle aspects of the game by breaking the path, and re-learning new path relationships. The warp also temporarily shifts the path from its navigational status, to being a track with suspended volition over which the player has no control whilst in the warp sequence. It is these two aspects of breaking the path, and of not being able to control the track created by the warp that show how paths and tracks can be seen as different routes through gamespace. The warp also shows how time can be manipulated within gamespace, and how the time of the real world is not always parallel with that of the gameworld. Ways of rewinding and fast forwarding time and narrative are all possible within the warp sequences that are not possible whilst on the one-to-one paths previously discussed in videogames. Reconstructing time and moving through the walls of the worldly maze is also not possible in quotidian reality, therefore these devices found along the maze-paths of the videogame start to show how our idea of the maze is modified by these virtual worlds.

Understanding warps in a variety of ways helps to understand the player experience further. Although all warps act as a way of breaking of the path, each warp has its own set of

characteristics allowing the player to see their avatar placed on new paths in a variety of different ways. Some warps allow for movement in one direction only, whereas others allow the avatar to move back and forth freely between warp start and end points. Puzzle Warps may be solved by opening up warps with keys found along paths either near the warp or before the warp is encountered, whereas unidirectional warps may be turned into bidirectional warps by the finding of further keys in order to return to previous paths or other paths somewhere else in the game. Separating the warp from the path, once again shows different ways that players' avatars can be moved through game space and the experiences the player may encounter in doing so. Understanding the warp device as another object along the path is vital in the different experiences paths and tracks can offer players. Once again this highlights the possibilities of the virtual world, distinct from the real world, and how the "magic circle" can be seen as a place for these types of play.

Figure 8.6 identifies the different characteristics of warps. Although some warps share these, others retain one or two unique features that separate them from each other. Using these characteristics it is possible to categorise jump warps, returns warps, swap warps and inadvertent warps as all have fixed elements in gamespace, whereas portal warps have movable elements, either both the start and end point or one of each. Just as Caillois made distinctions between his four categories of play (alea, agon, ilinx and mimicry) and created "forbidden, contingent and fundamental relationships"[316] between them, the table in Figure 8.6 can be used to understand characteristics of warps and start to map out similar combinations of relationships.

Jump warps are more commonly associated with advancing the game in some way, whether that be a cheat through an inadvertent jump warp, or a jump warp used as a deliberate reward function within the game; for example a warp that becomes opened once the player has gained a certain amount of objects/points. The notion of opening up warps with a special key or code can be applied to all warp types, such as in the game *Portal* where the flexibility of the positioning of the portal warp develops as the player makes their way through understanding and completing the preliminary levels. Some variations of warps, such as the aleatoric jump, may be more likely to have a key or code to open them, whereas visible jumps may allow the player to use them by simple entry. The categories within the table allow us to see various possibilities and how many warp types do cross over with one another. Characteristics such as the warp's destination tend to be more fixed as a way of

[316] Caillois, *Man, Play and Games*. 72-75.

differentiating between warps and it is here that fundamental relationships between warp types and some characteristics can start to form.

Whereas aleatoric jumps have random destinations due to the element of chance implied within their name, portals may have more fixed destinations as players are making their own decisions as to where the portal will take them by positioning their own end points (and possibly start points). Displays in warps tend to differ depending on how the warp is used. Portals generally have no display whilst in the warp as the warp is instant, with just the previous path and new path being shown. There may be an abstract display, such as swirling graphics, that connotes a feeling of passing from one place to another, but advances in game technologies mean that it is now possible for games to load more seamlessly, therefore not always needing a display whilst the next path is found within the system.

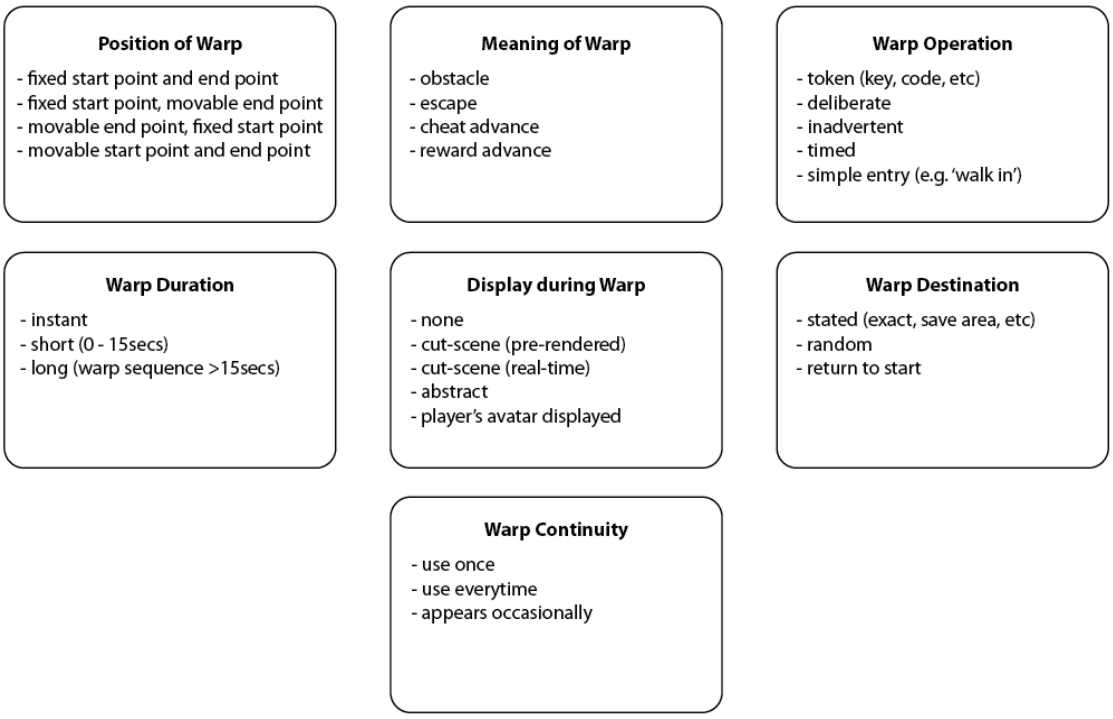

Figure 8.6 Characteristics of warps

Cut-scene displays have already been discussed as types of warp in their own right, yet when the player is warping from one path to another, such as in the directional warps within *Ratchet and Clank Future: Tools of Destruction*[317], where the player's avatar is forced to

[317] *Ratchet and Clank Future: Tools of Destruction* (Insomniac Games, Sony Computer Entertainment, 2007).

warp between lower and higher piece of architecture, the cut-scene is actually real-time rendered graphics showing the area the player is covering whilst in the warp. Although the player does not leave the level, its path is temporarily broken whilst in the warp and the warp acts as a device to disorient the player as they leave the comfort of one section of path and moves to another. The graphics in-between show the parts of the level the player may never experience, giving a sense of how large the world could be, yet it is not possible for the player's avatar to explore it all. The warp in this case moves the player through the world more quickly and determines which paths can and cannot be accessed. It also fills in parts of the game narrative by positioning the player within the world to understand what future obstacles may lie ahead. This type of advancement through the game acts as a reward rather than a cheat advance. Although a cheat advance can reward the player, it also restructures the levels of the game so parts of the game narrative can be skipped. By using the hidden tunnel warps within *Super Mario Bros*, the player is able to skip multiple levels to advance their progress, but by using this cheat, the player is also skipping the learning process of understanding how to complete each level as they get substantially harder. Skipping from the first to the last level leaves much of the game undiscovered, therefore (although finding the hidden warp may reward the player) they not be capable of completing the final level due to the lack of learning by overcoming previous paths. Concepts of learning through aporetic uncertainty on the paths and the feedback systems related to overcoming the aporetic experience are skipped in favour of a quicker end to the game which may not prove to be fruitful.

In laying out the characteristics of the warp in such a way, it is now possible to understand other possibilities as well as why certain combinations of characteristics should be avoided, such as those highlighted in Figure 8.7. For instance, an inadvertent long warp with no display that can be used repeatedly with random outcomes each time, probably wouldn't lead to a fulfilling experience on behalf of the player. To be constantly warping from one path to another may imply a bug in the system to some players. This in turn could lead to a sense that the player may never be able to complete the game as they were constantly being taken away from their goals. The constant disruption of the path may be seen as a hindrance rather than a reward, therefore the warp needs to exist within a balance of exploration and limited disruption in order to explore a new one. Just as other objects found along the path, such as the gates and keys, now have defined uses, it is important for warp devices to also have a definite use. This enables cycles of learning on behalf of the player to understand the object's

use, and where to break the path when necessary (whether the object is deliberately or inadvertently found).

As well as understanding characteristics that are less likely to be experienced together, the categories can be used to create and understand new types of warp that may not already exist. It is possible to imagine a warp that sweeps the player away at random intervals within the game and takes them to a new path never seen before, but this is somehow built into the goals and narrative of the game. The disruption of this random aleatoric warp may act as part of the built in puzzle of the game, making players re-learn new areas and develop other skills needed in order to progress. Having this type of warp emerging at one or two instances throughout the game may initially appear to be disruptive. However, the player will gradually learn the significance of this random warp function and realise how it will help their end goal or how to overcome the further obstacles it may produce. The warp, in this instance, becomes another aporetic experience of the path to be overcome. We could also imagine a warp that is timed and allows the player to experience a future path within the game, as if to offer a preview for a certain length of time, before being warped back to their original path. This may help develop skills in trying to defeat an obstacle further on in the game for a length of time pre-determined by the warp. In much the same way that players of *Prince of Persia: Sands of Time* can rewind time, this type of warp may allow players to fast forward and rewind parts of the game either through their own deliberate actions or at set points as determined by the game.

As the various characteristics outlined in Figure 8.7 show, warps can manifest themselves in various ways. It is now possible to understand how warps affect the player's experience of the path and how this effect is shown, whether in terms of rewards, narrative, time or a combination of different events. To understand the path is to understand the warp that can break that path, and how paths and tracks are separate elements of the gameworld that both complement and disrupt one another, enhancing the player's experience of the gameworld. The warp also shows how this device can change our cultural understanding of the maze within videogames, and how the maze-paths of the gameworld cannot be seen as separate to the objects found along them. It is through outlining these differences that this thesis has provided a new contribution to knowledge in how maze-paths are explored and moved through by the player and their avatar.

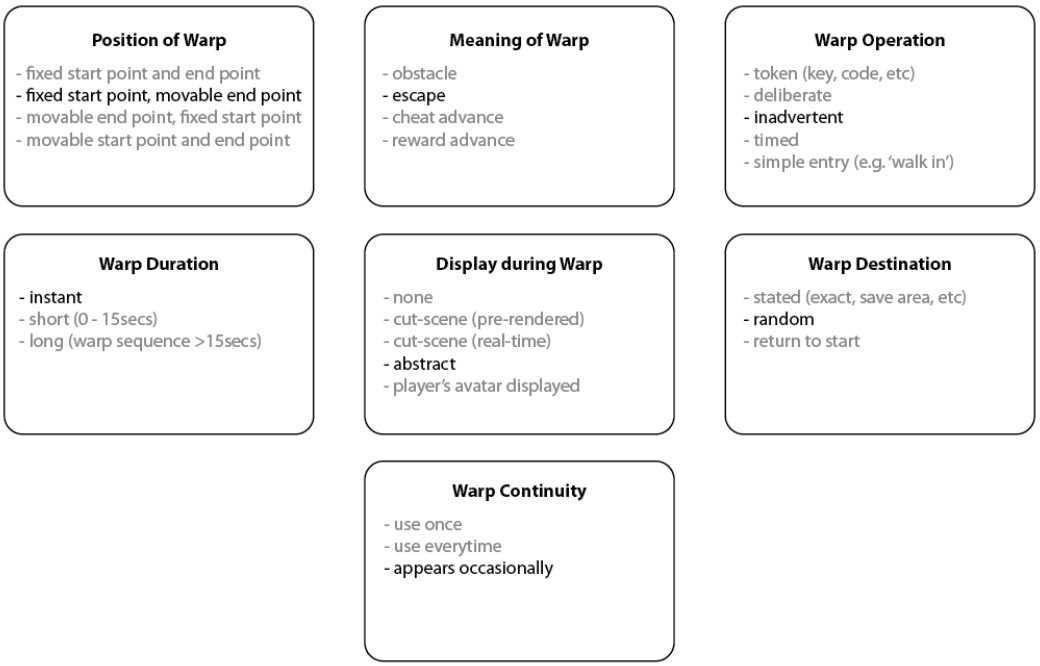

Figure 8.7 Warp characteristics players are unlikely to experience together

9. CONCLUSION

In this chapter the research carried out within this thesis is re-evaluated and further areas connected to it are discussed. The thesis started by posing the question of whether videogames rework our cultural understanding of the maze. The process of answering this question led to the construction of a morphology of maze-paths. The morphology was formed from an interrogation of the relationship between the real world maze and the maze-like paths that exist in the videogame. In comparing the paths of the worldly maze to those paths found within the virtual world of the game, it has been possible to draw comparisons between two similar structures. Through the work of Penelope Doob, the maze can be identified as both a mapped design seen from above, and an experience of walking through the maze. Although both map and experience are discussed within this thesis, the experience and nature of the path in the videogame have been the primary focus of my enquiry. Videogame paths are generated within the game system and are formed in different ways from the paths of the worldly maze. This research has served to further develop ways in which the experience, and cultural significance, of the videogame's generative path can be discussed, analysed and understood. This is evident in the identification of different path structures that can be found within the videogame, and by the way that the videogame path is linked to the discovery of objects within the gameworld. The path cannot be seen as separate from these objects and their uses, since a player's reactions to these objects are one way in which the paths are formed.

As this thesis has shown, the identification of different types of route in the videogame enables a more precise understanding of avatarial movement through various gameworlds. Figure 9.1 shows the full diagram of terms related to different routes, visualising the vocabulary developed throughout this thesis from chapter 3. The diagram illustrates how each of the separate diagrams previously shown in the thesis come together. Maze-paths are shown as having similar uses to those found in other path types, such as those of ritual and prescribed paths, and dotted lines were used to depict how these ideas could be linked between the different types of route. In order to consider maze-paths and tracks, other types of worldly path have also been discussed in an attempt to establish that maze-paths have different uses from the other path types. It is for this reason that maze-paths can be seen as special types of route. Their multiple uses show how it is possible to use the similarities and differences of the worldly maze and the virtual maze as a way of understanding different path types (or maze-emes). It is possible to see Figure 9.1 as a depiction of all paths within the real

world, yet only maze-paths and tracks were used within the research as a mapping between the real world and virtual world experiences.

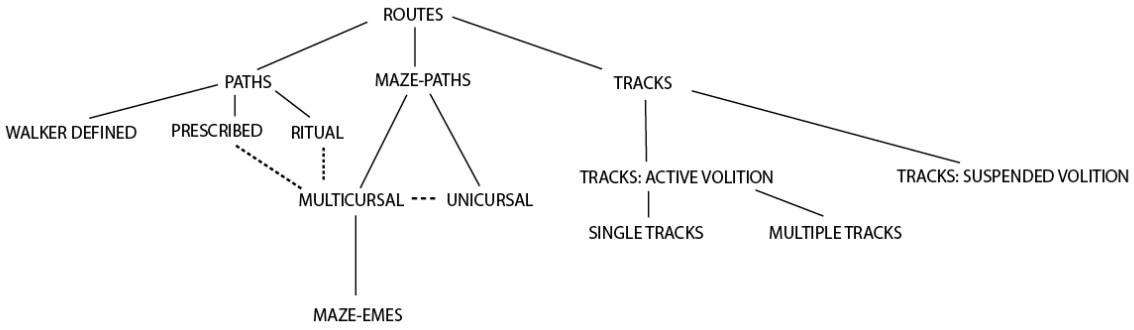

Figure 9.1 Categories of routes, paths, maze-paths and tracks
(Dashed lines signify categories that can be linked through similar terms)

Revisiting the histories of the maze, in terms of its changing cultural uses and meanings, has been an essential part of the developing research process. Rather than validating common metaphorical terms for the multiple paths of the videogame (e.g. the 'rhizome'), understanding the maze as a structure has raised further questions about the specialist discussion of maze-like paths. It is now clear, for instance, that the paths of the worldly maze, and the paths of the gamespace often correspond. It can be seen, however, that videogame technologies develop maze-paths in a new and distinct way. Discussing the maze in terms of its separate elements has also challenged established ideas about unicursal paths and the restriction of movement. Highlighting the separate elements of the maze enables further questioning of the distinctions between the multicursal maze and unicursal labyrinth. Although unicursal straight paths exist for players to move their avatars from A to B, the winding structure associated with the physical labyrinth is no longer present in the virtual world. However, other functions of the labyrinth – particularly those which can be seen as ritualistic – seem to remain integral to the act of playing the game. Players may, for example, continually move up and down the same path in search of new items or different outcomes. As with the real world maze, the videogame path can offer different experiences each time it is played.

Breaking down the maze into individual elements (or maze-emes) allows us to consider each path type and understand how various objects may disguise paths. This leads to a further understanding of how path types can link to one another and how the concept of the aporia:epiphany can help with the mastery of the game. It is these experiential and learning

aspects of the gameworld that distinguishes my concept of the path from other research in the area. Although game design structures are discussed in this study, the emphasis has been on how the player *experiences* these structures.

In the opening to their book *Patterns in Game Design*, Björk and Holopainen state that:

> we use the terms game design patterns instead of gameplay patterns to stress that these are patterns of interaction which are intended by game designers, and that the patterns aim to support not only analytic work but also creative design work.[318]

Some of Björk and Holopainen's patterns are commented on within this thesis, especially in relation to objects found along the path. However, an appreciation of game design has not been an end in itself; rather, it has informed a more particular contribution to understandings of player experience.

In the introduction to this thesis, I predicted that it would be of interest primarily to those who are concerned with understanding and theorising the videogame as a cultural artefact rather than to those who are practising games designers. While it is possible for the designer to have a view of a section of a game such as the one illustrated in Figure 9.2, game *players* may experience the same section in different ways; this is clear from the path combinations depicted in Figures 9.3 and 9.4 respectively. The *designed* path (Figure 9.2) is constructed of four elements. These are a straight path, a key, another straight path opened up through the keys successful operation, and finally a loop along. This is the route that the designer intended for this part of the game.

Figure 9.2 The designed path (straight path, key, straight path, loop along)

However, the player may find the key on the straight path but then be unable to find a way of using it in order to open up the next straight path (Figure 9.3). In this case the player does not overcome the aporia or experience the resultant epiphany. It is possible for the player to admit defeat and consequently not experience the rest of the gameworld. The game may be

[318] Björk and Holopainen, *Patterns in Game Design*. 4.

abandoned at this point, or the previous paths may be revisited in the hope of finding how to open up alternative paths. This is an instance of purposeful play, previously defined as that intended by the designer. With the player being unable to open up the rest of the game's paths a decision may be taken to end the game.

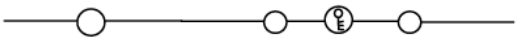

Figure 9.3 Player Experience 1 (straight path, key)

The final path combination (Figure 9.4) highlights a case of appropriated play experienced by those characterised as aberrant players. The diagram illustrates how acts of appropriated play can open up new areas to be explored by some players. In this scenario it is possible that the player works out how to use the key and opens up another straight path. Instead of the player then experiencing the loop along, as intended by the designer, an inadvertent warp is discovered, highlighting the notion of appropriated play. Figures 9.3 and 9.4 show how different players can have varying experiences of the same designed paths of the gameworld. Although the designer has an overview of how the gamespace should be traversed, it is possible for the player to create new experiences, through lack of skill at particular moments, or through a further exploration of the game's system. Defining both purposeful and appropriated play demonstrates how it is possible for players to explore not just the virtual architecture of the gameworld but also the rules that underpin the generation of the path.

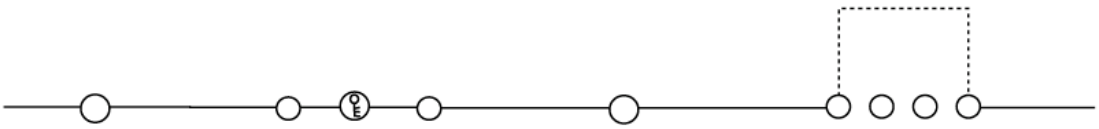

Figure 9.4 Player Experience 2 (straight path, key, straight path, inadvertent warp)

This thesis, then, is contributing to new knowledge within the field of videogame studies by providing a morphology of path structures based on an understanding of the player experience. The morphology identifies how maze-paths can be joined together and revealed through overcoming puzzles. In focusing on the player's experience of the path, recognising different acts of play and the ways in which the path is generated by the player, the importance of what I have termed the cultural logic of games becomes clear. Videogames are not always played in isolation. Even if they are played by a single player, alone in a

geographic space, there is still access to other media such as walkthroughs, internet forums, social networking sites and so on, so that players extend their own experiences in relation to the experience of others. Such media enable players to seek help with certain games and also to interrogate the game world further, at the same time showing other players what they have discovered. As I have demonstrated, the cultural logic of games therefore recognises the wider contexts of gaming culture, including practices that extend beyond simply 'playing the game'.

Before concluding this thesis, it is important to understand other factors that could be taken into account in discussions of the path. As stated within the section on research methodology in Chapter 3, certain games were deliberately chosen in terms of their distinctive player:path relationships. These games usually contained first or third-person viewpoints providing a framework for discussing videogames using the morphology of maze-paths. This thesis has been concerned with the direct paths of the videogame. Direct paths were defined in Chapter 3 as those that allowed for a one-to-one relationship between the player's avatar and the path. To understand other routes in the videogame more fully, there needs to be further analysis of the avatar and its role in changing the player's perceptions of the gameworld. A natural progression for this research might be an investigation of the avatar and its relationship with the path or track.

Terms currently used to label games, such as 'first-person' and 'third-person', identify a character display but do not necessarily define an experience. A reliable way of classifying relationships between the player and the avatar within the game has yet to be established and it is in this area that future research may take place. Although there have been discussions about the relationship between the avatar and space by theorists such as King and Krzywinska, Wolf, Klevjer and Bayliss, these may not overlap fully with concerns about the avatar:path relationship.[319] There now needs to be more research within this area so that an understanding can be gained of the shifts within avatarial representations in relation to the videogame path. In the opening to their sub-chapter 'degrees of presence', King and Krzywinska note:

> in some games, regardless of the scope for exploration, the player occupies a space clearly distanced and separate from the game-world. In others, the

[319] See, King and Krzywinska, *Tomb Raiders and Space Invaders: Videogame Forms and Contexts*, 97, Wolf, *The Medium of the Videogame*, Rune Klevjer, "What is the Avatar?" (PhD diss., University of Bergen, 2006) and Peter Bayliss, "Beings in the Game-World: Characters, Avatars and Players", in *IE2007 (*Australia, 2007).

> player is given an illusion of presence, of being located inside the gamescape, directly in the thick of the action.[320]

This can be linked to the comments made in Chapter 3 about the distinction between games possessing direct paths and those characterised by displaced paths. These two terms were drawn from Juul's mapping of "play time" to "fictional time".[321] Games containing direct paths, where "play time" and "fictional time" correspond, became the sole focus of this research. Paths such as these were seen to deliver a greater sense of immersion and "agency"[322], due to the player having a third-person or first-person view of their avatar. This contrasts with games using displaced paths that offer a view of a group of game characters from above, or that work through controlling the placement of objects in a game, as in *The Sims*. This leads to a questioning of how the displaced paths of the videogame can be discussed separately from direct paths, or whether there might be links between the two. In order to understand the relationship between games that have direct paths and those that have displaced paths, future researchers may be able to clarify matters through a discussion of the player's relationship with the avatar.

In comparison with the first-person shooters of the 1990s, such as *Doom* or *Quake*[323], games such as the 2009 release, *Mirror's Edge*,[324] now offer a different experience for the player in terms of how the avatar can be viewed. In *Mirror's Edge*, the legs and arms of the character are displayed, creating a different played experience from that provided by the slightly more static movements of the original characters in *Quake*, where only an arm holding a weapon or the character's fist were displayed. *Mirror's Edge* allows for a much closer first-person point of view, creating a further illusion of presence. Game technologies are developing to allow players to feel as though their real world movements are strongly connected to what is occurring on the screen. This can be seen through the technology of the Nintendo Wii. Steven G. Jones describes how:

> players leap around and swing their arms as the controller, with its accelerometer and gyrometers as well as button controls, translates those analog movements into code that translates into digital representations on the screen of swinging tennis racquets or slashing swords. When you strike

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[320] King and Krzywinska, *Tomb Raiders and Space Invaders: Videogame Forms and Contexts*. 97.
[321] Juul, *Half-Real: Video Games between Real Rules and Fictional Worlds*. 142.
[322] Murray, *Hamlet on the Holodeck*. 110.
[323] *Quake* (iD Software, 1996).
[324] *Mirror's Edge* (Electronic Arts, 2008).

> something in the game, the haptic interface vibrates the controller in your hand.[325]

The development of interactions triggered by the player's body, such as the movement of the Wii controller, shows how it is possible for some game actions to coincide with real world events. The obstacle course mini-game included as part of *Wii Fit Plus* highlights this increasing connection between the player and their avatar.[326] In this game, the player has to walk on the spot on the Wiiboard in order to make their avatar walk through the obstacle course in the virtual world. Rising onto tip-toe, the player recreates the motion of their avatar jumping within the game world. Real world actions are translated more directly into the virtual world space, than they would (or could) be by a series of button presses, allowing for a greater connection between player movement and the movement of their respective avatar. These instances highlight how the one-to-one relationship between the player's body and the in-game avatar is becoming more direct and complex than in earlier first-person and third-person games.

There are an increasing number of games that depict the player through a cursor on screen, such as the puzzle game *Boom Blox*.[327] This may be seen as essentially a first-person point of view, even though the player can change the view of the gameworld. Here the player can move from being above the puzzle to being at the level of the puzzle, emulating Doob's statements about the maze offering both a mapped view and an experience at the level of the path. Cursor displays are also used in games where the player controls a team of characters, such as in football simulation games. It can be seen that videogames are able to have changeable viewpoints so that the player can switch avatarial position from the first-person to the third-person. There are also god games that may include the means of being able to change the viewpoint from an overall perspective of the gameworld to one that is at the same level as a single avatar or a team of avatars. Therefore, definitions of player:avatar relationships are required to understand the relationships between the avatar and the path. It may be that the vocabulary of paths and tracks within videogames can be further developed in relation to other game genres. Further consideration of the avatar and the path may also lead to new understandings of how relationships between the track and the player's avatar may differ from those of the relationship between the path and the player's avatar. Initial answers to this question were explored within the discussion of warps and tracks in Chapter

[325] Steven G. Jones, *The Meaning of Videogames* (New York: Routledge, 2008), 54.
[326] *Wii Fit Plus* (Nintendo, 2009).
[327] *Boom Blox*, (Electronic Arts, 2008).

8, where it was shown that the warp can change the viewpoint of the avatar. This can also be seen in cut-scenes within some first-person games that can take the player from having a one-to-one relationship with the path, to becoming an observer and seeing their avatar in the third-person whilst the cut-scene is acted out in the virtual space. Exploring the player relationship with the avatar in the warp – understanding, for instance, how the player can become a viewer whilst experiencing tracks with suspended volition – also raises further questions as to how we can discuss the player relationship with the avatar during different gameplay scenarios. This remains, however, a new area of enquiry to be developed beyond this study.

It may be that videogame genres can be reconsidered in terms of the path, focusing on the player experience. This can be linked to the work of Egenfeldt-Nielsen *et al* in their attempts to reclassify game genres in terms of the played experience rather than the designed experience.[328] Sets of terms could be used to define game genres. Games may be categorised in terms of tracks or paths. These may be broken down further into game where the paths exist directly inside the videogame or games that are more displaced in terms of how the sequences of events are experienced. It may also be possible to establish a taxonomy of terms related to the path structures in games with displaced paths. Strategy games such as *Civilization* are comprised of the player making decisions and movements of their team based on an overall view of the game board and other teams involved.[329] The pre-planned paths of this game differ from the paths that emerge by moving through the spaces of first-person and third-person games. However, the consequences encountered along the path still affect the game play. It could also be seen that these paths shift from being paths to being tracks and vice versa, and other relationships may occur accordingly. By defining a vocabulary of routes through the gameworld, be they maze-like paths or tracks, it becomes possible to discuss a wide range of game genres in terms of these player:path relationships. These definitions act as a way of discussing both the single and multiplayer experience. Aarseth separates the single player and multiplayer experience by stating that:

> the single player landscape is asymmetrical, often linear with one main path through it, and 'evil' troops placed in ambush along the way" whereas "the multi-player landscapes of 'myth', on the other hand, are symmetrical, open and usually arranged around a central point.[330]

[328] Egenfeldt-Nielsen, Smith and Tosca, *Understanding Video Games*. 41.
[329] Sid Meier, *Civilization* (MicroProse, 1991).
[330] Aarseth, "Allegories of Space: The Question of Spatiality in Computer Games", 168.

It is now possible to discuss a game in terms of its paths and through an awareness of such landscapes. By constructing a vocabulary of maze-emes, it is possible to see how path structures found within the maze can be experienced whilst playing various game genres. Removing generalisations about the way spaces are constructed reveals the specific nature of the player experience. This provides a way of understanding and discussing videogames as cultural artefacts.

This thesis set out to answer the question of whether 'videogames rework our idea of the maze?' Extending the work of Doob in earlier chapters and defining the generative nature of the videogame path, has suggested that this is the case. As I have indicated, the maze-paths of the videogame are not fixed. Through comparisons of the worldly maze-paths and the maze-paths found within the virtual world, it has also been shown how the metaphors and uses of each path type have also evolved. Dead-ends in videogames may in fact be gated paths that can be unlocked. While the dead-end of the real world maze is a path to be feared, the dead-end of the videogame is often expected to provide reward and is a place to be sought out. The objects found along the maze-paths of the videogame mark them out from the maze-paths of the worldly maze.

The experiences of the maze, such as being lost and finding the correct route from beginning to end, can be found within the maze-paths of the videogame. However, these experiences are heightened within the worldly maze through its fixed structure. In many ways the ubiquitous nature of the maze within videogames is hidden through its generative nature, with path evolving through the objects found along it. As I have shown, devices such as the warp rework our experiences of paths and tracks within the gamespace. The warp in many ways disguises the maze-path, as it is a construct of fiction and only possible within the virtual world. The warp also temporarily breaks the experience of the path, altering the player's perception of the gameworld until a new path is joined. Other objects can also hide each path type with new paths being revealed through the player overcoming the aporia and experiencing the resultant epiphany. Identifying game paths with reference to objects found along them now allows for these ideas to be developed as game worlds continue to evolve. This evolution will also continue to reframe our cultural relationship of the maze.

The experience of the videogame path and the maze changes the cultural logic of the worldly maze. The worldly maze itself is adapting in the way it functions, with many mazes now offering puzzles, such as the Japanese fence mazes and the Dragonfly Maze mentioned in

Chapter 4. There also exists a water maze at Les Jardins de la Mer, St Helier, on the island of Jersey, that is constructed of jets of water, which change at various intervals, restructuring the maze design as people make their way through it.[331] As our cultural understanding of the possibilities of technology continues to expand so too may the acceptance of generative maze designs in the real world. The videogame allows for generative routes through virtual architecture and changing path structures. It is possible that this acceptance of the cultural logic of games may infiltrate other aspects of play within our lives, allowing for different designs of real world mazes to be thought out, different uses of the maze metaphor which so commonly describes new and unfamiliar geographies. The audiences that visit worldly mazes are also changing and this may bring an increased expectation of mazes with changing paths due to their familiarity with virtual world media. The growth of technologies related to both real world and virtual maze-path designs may once again rework our cultural understanding of the maze and the paths and objects related to it in years to come.

[331] Adrian Fisher, *The Amazing Book of Mazes* (London: Thames and Hudson, 2006), 177.

GLOSSARY

Aporetic experience: Finding an aporia in a videogame in the form of a designed puzzle, an inadvertent aporia in the form of a bug or bad design, or learning the skills to overcome an aporia.

Aporetic uncertainty: The process of how to overcome an aporia. Process involves a sequence of: movement along a path, 'pause' in the path flow, cognitive process, decision/indecision, action, and consequence of the action. Each process has a different level of aporetic uncertainty as it becomes more apparent as to how to solve the aporia.

Aporia: a pause along a path.

Appropriated play: playing outside of the rules of purposeful play in an exploration of the game system.

Contributive aberrant player: player exploring the game system and finding new syntagms of play within it. Shares this knowledge with others players to enhance the game.

Cultural logic: the cultural understanding of games and their players. The way information about games is communicated, shared and discussed amongst a similar community.

Direct videogame paths: videogames with a 1:1 relationship between the player and the path, most commonly found in first-person and third-person games.

Displaced videogame paths: videogames that situate the player ‘outside’ of the gameworld, usually found in strategy, turn-based and team-based games.

Disruptive aberrant player: player playing outside of the rules of the game deliberately disrupting game for others.

Maze: Deliberately constructed prescribed paths laid out in various designs contained within a fixed position on a landscape.

Maze-eme: Component of a maze path, each offering different experiences for the player/walker. A set of maze-emes can be combined to form different routes through a maze.

Multicursal maze paths: A set of prescribed paths offering a choice of routes for the walker/player in finding her way from point A to point B.

Path: a bi-directional route from point A to point B.

Path determined by the walker: A path formed through the act of wandering, created freely and evolving through the walker's movements in that instance.

Prescribed path: A marked path on a landscape such as a pavement.

Purposeful play: type of play following the designed rules of the game.

Ritual path: A path determined by outside influences to the walker as to how to walk the path. The walker is however free to still make choices and decisions along the path.

Route: a way or course taken in getting from a starting point to a destination (dictionary definition)

Track: a unidirectional prescribed route not allowing for player navigation.

Track with active volition: tracks that allow for some decisions on behalf of the player, such as changing track, how fast or slow the track is taken, how to defeat any enemies on the track. Can be comprised of single tracks or multiple tracks.

Track with suspended volition: tracks that do not allow for any decisions to be made on behalf of the player. Player becomes viewer in these instances as all control is momentarily removed.

Unicursal maze path: A singular maze path marked out from point A to point B. Used in reference to labyrinth structures.

Videogame path: generative, cannot be seen in isolation to the objects found along it.

APPENDIX

Mazes I have visited as part of this research

- Blenheim Palace Hedge Maze, Oxfordshire, UK
- Chartres Labyrinth, Chartres cathedral, Chartres, France
- Dobbie's World Mazes, Warwickshire, UK
- Dragonfly Maze, Bourton-on-the-Water, Gloucestershire, UK
- Ely Cathedral labyrinth, Ely, Cambridge, UK
- Escot Park Maze, Devon UK
- Glendurgan Hedge Maze, Cornwall, UK
- Greys Court, Oxfordshire, UK
- Hampton Court Maze, Surrey, UK
- Herb Farm Maze, Sonnig Common, Reading, UK
- Hilton Turf Labyrinth, Cambridge, UK
- Italianate Maze, Capel Manor, Enfield, UK
- Julian’s Bower, Alkborough, Yorkshire, UK
- Leeds Castle Hedge Maze, Kent, UK
- Marlow Millennium Maze, Marlow, UK
- Mizmaze, St Catherine's Hill, Winchester, UK
- Richings Park Maize Maze, Buckinghamshire, UK
- Royal Windsor Maze, Windsor, UK
- Seaton Labyrinth, Seaton, Devon, UK
- Troy Town Labyrinth, near Dalby, Yorkshire, UK
- Turf Maze, Saffron Walden, Essex, UK
- Wing Turf Maze, Wing, UK

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