The Effect of the Non-Human on the Generation of Narrative and Space in Digital Games

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PhD 2023

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A thesis submitted in partial fulfilment of the requirements of Manchester Metropolitan University for the degree of Doctor of Philosophy

Department of English

Manchester Metropolitan University

2023

Abstract

This thesis investigates entanglements between digital game narratives and non-human matter through a framework of game space which draws on theories of spatial production and non-human agency as well as insights from the Gothic. The framework proposed in this thesis positions non-human matter as both space and narrative co-constructors, existing alongside, and working with, players, and developers. By way of this framework the project contributes significantly to the understanding of how game space, narrative, and players intersect, highlighting the ways in which these identities emerge from their relations. Through a close reading of three Gothic game texts *The Binding of Isaac: Afterbirth +* (Nicalis, 2017), *Bloodborne* (From Software, 2015), and *Death Stranding* (Kojima Productions, 2019), the research explores the ways in which non-human matter, specifically procedural content generation, non-player characters, and game space, are agentive aspects working alongside the human player in the generation of narrative. As such, this thesis identifies games as sites of collaboration between the human and the non-human.

The thesis is structured to trace the entanglements between player and game steadily outwards, beginning in the intra-story world of the game, leading, ultimately, to the imbrication of games with the wider phenomena of the climate crisis. Each chapter is connected through the problematising of human-centred notions of space and finds that in their co-construction of narrative and space, digital games illuminate current anxieties surrounding consumption and the environment. By the conclusion the thesis finds that digital games are not only part of the entanglements which form what we understand as the climate crisis but are also folded into the crisis themselves, from their development, shipment, and consumption to how they reinforce harmful notions of nature as a hub of resources open for extraction. As a result, the findings of my research contribute to emerging scholarship in game studies that seeks to recentre the non-human in explorations of space and narrative.

Acknowledgements

Thank you to my supervisors, Chloé Germaine and Paul Wake, for your top-notch advice and encouragement over the past five years. These would be empty pages without your guidance, patience, and kindness.

I would have never have finished this project without my family. Thank you to my mum who has forever been my number one supporter, who has always been just a phone call away, and has heard out every rant and every triumph however large or small. To my dad, who taught me that by meeting each day with patience and perseverance you will eventually find gold. To my sister, who carved out the way ahead and showed me that there is light at the end of the tunnel.

Finally, thank you to my partner, Sam, who encouraged me to go for it and was with me every step of the way. There have been so many hurdles, but you have been with me each day to help me get through each one. You have been, and always will be, a star.

Contents

Introduction

Without the non-human playing a digital game would be impossible. To play a game is to choose to engage with the non-human in order to experience a game's narrative. This thesis investigates this entanglement of digital game narratives and non-human matter. It responds to post-human and ecocritical approaches applied to game studies, narratology, and the study of the Gothic. These approaches tend to counter anthropocentrism by figuring the human as part of a network of actants rather than as the central or hierarchal leader within the world. Through a close reading of three Gothic game texts, *The Binding of Isaac: Afterbirth +* (Nicalis, 2017), *Bloodborne* (Fromsoftware, 2015), and *Death Stranding* (Kojima Productions, 2019), I establish the ways in which digital games can be considered as nested spaces; intra-story worlds which are entangled with a player's external reality. I argue that the process of generating game space and narrative necessitates interaction between both human and non-human agencies. Through considering digital games as a nested space and their co-creation as occurring via the collaboration of multiple agencies, I state that games can be enfolded into conversations regarding wider sets of entanglements as both material and narrative objects, of which this thesis takes the climate crisis as an example. Further, I determine that the types of interaction that happen during play between humans and non-humans, co-constituting and collaborative, can act as a point of reference to pattern behaviours with non-human elements outside of the intra-story game space. Play, this thesis argues, is a mode of engagement which can affect how humans and non-humans relate to each other whilst also affecting the outcomes of the continual entanglement of these agencies. By drawing on theories of spatial production and non-human agency – in particular those elaborated in the work of Karen Barad – my analysis of the ways in which these texts recognise the agentive power of non-human elements explores their entanglements within the production of space and narrative. In this exploration, I problematise human-centred notions of space and find that in their co-construction of narrative and space, digital games illuminate current anxieties surrounding consumption and the environment.

In this introduction I set out my research aims before exploring the theoretical coordinates which this thesis engages through five sections: the magic circle, game studies and space,

narratology and space, and agential realism, and the Gothic. I then outline the structure of the thesis, providing synopses of each of the four chapters and the conclusion. The structure of this thesis emerges from its three research questions, each of which relate to one another through how they trace the entanglements between digital game narratives and non-human matter. They each focus on a specific aspect of the relationship between players entering a game world, the non-human matter that comprises a game, and an entangled, co-constructed 'external' reality outside the game world. Listed below are the research questions of this thesis:

1. What is the relationship between space and narrative in digital games?
2. How does the non-human matter of AI affect the narratives of digital games?
3. How are the material conditions required for the production of digital games, as well as the presentation of their intra-story space, affecting and affected by the climate crisis?

Taken together, these questions structure a narrative of exploration undertaken in the writing of this thesis, from focusing on an internal interaction within games to a recognition of games' wider involvement in processes which are continually shaping the environment and the climate crisis. To answer these questions, I present four objectives which sculpt the chapters that follow. Whilst aspects of each research question inform all four chapters, for example the relationship between space and narrative is continually returned to throughout the thesis, each chapter is led by a single objective. They are as follows:

1. To provide a framework for the analysis of space in digital games.
2. To interrogate how the use of AI to generate game space, Procedural Content Generation (PCG), affects the generations of narrative within those games.
3. To expand the term non-player character (NPC) to include agentive non-human matter.
4. To establish game space and narrative to be entangled with the climate crisis through both the physical demands of digital games on the environment, as well as the narrative positioning of the climate crisis both in and outside games.

The first objective shapes chapter one which details the ways in which narrative and space relate in digital games. The following two chapters are led by the second and third objectives

respectively, both addressing the question of how non-human matter affects the generation of narrative and space in Gothic digital games. The final objective, which structures the fourth chapter, aids in answering the final research question, widening the scope of the thesis to incorporate questions about digital games' role in the becoming of the world.

To assist in answering these research questions I set out three case studies, *The Binding of Isaac: Afterbirth +*, *Bloodborne*, and *Death Stranding*. All three provide examples of the differing ways in which the non-human and the human co-construct game space and narrative. In taking an agential realist approach to the thesis's case studies, the project contributes significantly to the understanding of how game space, narrative, and players intersect, highlighting the ways in which these identities emerge from their relations. Throughout the examination of the case studies, I consider NPCs as non-human, as although they can take human shape, and act like humans, they are ultimately the product of the intersection of programming and a designed model. As such I argue that my use of Michel de Certeau's human-centred theory of the production of space, does not incorporate human-like NPCs as constructors; instead, I temper de Certeau through the inclusion of Karen Barad's theories of non-human agency and entanglement. My work demonstrates how the aforementioned NPCs alongside other non-human elements, in particular PCG, space, and game peripherals such as controllers, function during play as active participants in both their own becoming but also the becoming of the game and wider worlds. The subsequent findings of my research contribute to emerging scholarship in game studies that seeks to recentre the non-human in explorations of space and narrative.

I have chosen to use the term digital games over video games in this thesis to highlight the fact that games emerge from coding of data into files which are reproduced when players play them. In addition, the term situates games within a wider set of entanglements which include the array of digital accompaniments to the game itself – including reviews, guides, twitch streams, YouTube videos, and game mods, as well as the material reality of digital game production which includes large servers, the mining of precious materials to make consoles, and the creation of plastics for controllers, consoles, and game packaging.

In collating my case studies, I have chosen games created in the Gothic mode. Although

emerging from eighteenth- and nineteenth- century British literature, in our contemporary culture the Gothic is a pervasive mode that encompasses multiple media and genres. In their introduction to *Twenty-First Century Gothic*, Maisha Wester and Xavier Aldana Reyes argue that delimiting the boundaries of the Gothic has become difficult because 'the mode has evolved into an artistic palimpsest with tendrils reaching out into virtually every connected genre and subgenre' (2019:4). The Gothic, as it has evolved, is not limited to specific settings and characters, but instead is categorised by how the mode's sentiments are adapted into different mediums and genres. For the purposes of this thesis, I define the Gothic by building on Chris Baldick's definition of the term. He argues that the Gothic is characterised by 'a fearful sense of inheritance in a time with a claustrophobic sense of enclosure in space, these two dimensions reinforcing one another to produce an impression of sickening descent into disintegration' (1992:xix). To this description of the Gothic, I add that it tends to narrativize an uncanny shift of agency from a strictly human agent to congealing also within the non-human. This is supported by work in the Gothic which highlights the mode's roots in examining the agency of non-human matter. In his book *Gothic Things: Dark Enchantment and Anthropocene Anxiety* Jeffrey Andrew Weinstock states that 'at its core, the Gothic is about what happens when things acquire uncanny animacy (2023:13). Non-human agency threatens to decentre the human, and it is from the surfacing tension of a perceived loss of human control, that a 'dark underside to the nonhuman turn' materialises (12). The relevance of this idea of the Gothic is apparent for digital game scholars. As Ewan Kirkland remarks, 'Medium-specific tensions between interactive agency and ludic control, the construction of vastly elaborate spaces, the generation of mechanical, inhuman, uncanny digital monsters, […] are qualities all potentially put to service in generating the Gothic videogame experience' (2022:12). In other words, Gothic games play with agency, space, and the non-human as part of adapting the Gothic to the medium of games. This decentring of the human to become part of a realm of monsters and the monstrous threatens the exceptional agency the human is granted in other modes of narrative construction, making these case studies a particularly productive ground through which to explore the questions this thesis addresses.

Space, a key aspect of Baldick's definition, is a connecting thread throughout this thesis seen in the spatial dimension of games, the modes they are written in, and the link between the intra-story space of a game world and the external reality of the player. By space, I take

Doreen Massey's definition in her book *For Space*, which presents three propositions. Space is at once:

1. 'The product of interrelations; as constituted through interactions' (2005:31). Space is made from the relations that exist within it. These interactions include those global or microscopic in scope, meaning that space is constituted through the interactions of all matter, rather than something which should be considered in a vacuum.
2. 'The sphere of the possibility of the existence of multiplicity in the sense of contemporaneous plurality' (2005:31). Space is not one thing, but instead made up of many of the relations Massey points to in the first proposition. Many processes are happening through space at any one time, including, of interest in this thesis, a multitude of narratives.
3. 'Always under construction' (2005:32). Space is always in the process of being produced. It never stops emerging and is a dynamic aspect which we as humans live with instead of on.

Massey ends her definition by suggesting that it is possible to view 'Space as a simultaneity of stories-so-far' (2005:32). The study of space for Massey is the study of a cross-sectional cut through an abundance of narratives lived day to day. Place is a specific example of space, one of these cross-sectional cuts, a case in point of this could be my house in Preston. As a place there are specific relations that continually produce it and it contains multiplicities: it is where I live as well as where other non-human animals call home, it is also located politically within a labour stronghold, and like most British homes was built to retain heat which exacerbate the problems that result from increased intensity and regularity of heatwaves caused by the climate crisis. All these aspects, personal, political, and ecological are unfolding as part of this specific example of space, and while this thesis draws out specific ones to explore, space is never just a singular element. I have chosen Massey's definition as it provides a foundational understanding of space which considers the spatial and the storied as inherent parts of each other, a viewpoint which is foundational for the framework of game space I present and build on throughout the thesis.

In addition to Massey's definition, I also draw from the spatial theory of Michel de Certeau

as set out in *The Practice of Everyday Life* (1988), which seeks to combine the navigation of a space with the reading of a text. Both Massey and de Certeau view space as being built from narratives. What de Certeau adds is a method of reading space like a language, structured through the intricacies of grammar and the complexities of spoken language. De Certeau looks at the city as 'the most immoderate of human texts', an excessive example of human-made space, both for its buildings and roads, and for the mass of people who live in the city. Those that are above the city are able to look down and read it; the act of reading becomes an extravagant and salacious act, to which de Certeau asks 'to what erotics of knowledge does the ecstasy of reading such a cosmos belong?' (de Certeau, 1988:92). For those above looking down on the city, the opportunity to read a space is seductive as it lays out the whole text below. The seemingly totalising view offered to those looking down is false as space cannot be viewed completely by one perspective. To return to Massey, space contains plurality, meaning a top-down viewpoint provides only a singular frame of reference regardless of the amount of space viewed at once. On the other end of the scale de Certeau positions those that find themselves in the street of the city are unable to read the city, like those looking down from above, but instead trace the streets like the 'thicks and thins of an urban "text"', their seemingly blind movements through the city 'compose a manifold story that has neither author nor spectator' (1988:93). Through spatial theory I position players as part of the production of space, arguing that being a player within a game's space is comparable to being both a 'voyeur-god' (1988:93) and the person walking in the street.

By taking insights from new materialisms, specifically several taken from the work of Karen Barad, and adding them to this notion of spatial theory as human generated, I expand the range of actors which co-construct space and narrative to move beyond the human to encompass the diversity of non-human elements of AI, space, and the physical materials which facilitate play, such as plastic. The synthesis of Barad, spatial theory, and the Gothic provides the structure through which I present a theory of non-human matter as narrative co-constructors alongside the player and the author or developer. It begins by viewing games as nested spaces, focusing on the interactions between players and games which produce the entanglement of intra-story space and narrative. By the conclusion of the thesis, I widen the focus to include the external objects which facilitate the playing of games, the controller and the plastics out of which they are constructed, and the external spaces, the environment which both affects how

games are played and are affected by the playing of games.

As noted, this thesis operates at the intersection of a range of disciplines: namely (i) game studies (ii) narratology, and (iii) the study of the Gothic as a cultural mode. These three areas are connected in this thesis by the much-discussed concept of the 'Magic Circle', a concept that originates in the work of Johan Huizinga and which was brought into game studies in the work of Katie Salen and Eric Zimmerman (2003). In order to situate the thesis at the intersection of these three overlapping modes of inquiry, the literature review that follows begins with a discussion of this very particular form of game space. The conclusion to the thesis will also return to the visual of the magic circle, as a way of framing the thesis' application beyond the space of games.

The Magic Circle

The concept of the magic circle has been a much-debated term used in game studies, with academics both defending and attacking the term's functionality. The majority of debate occurred in the late 2000s and early 2010s, with theorists offering alternatives to the term (Juul, 2008), presenting arguments for its erasure (Calleja, 2012), or rejecting its existence entirely (Consalvo, 2009). Meanwhile Chloé Germaine, Stenros Jaakko, and Eric Zimmerman look to incorporate the magic circle into their scholarship, either defending the term (Jaakko, 2012), building on the initial metaphor to present it as simultaneously a reinforcing and disrupting force (Germaine, 2022), or restating the term in response to criticism (Zimmerman, 2012). My use of the term in this thesis is intended to indicate an overlapping point between game studies, spatial theory, the gothic, narratology, and new materialisms. The magic circle, I argue, becomes a mass of entanglements and agencies, drawing these different academic fields together. The term 'magic circle' initially comes from the work of Huizinga in his 1955 book *Homo Ludens*, where he introduces the term, alongside other bounded areas such as courts of law, cinemas, and sports arenas, to denote a physical space of play, inside which humans take on the role of "players" who play according to an accompanying set of rules. For Huizinga, 'All play moves and has its being within a play-ground marked off beforehand either materially or ideally, deliberately or as a matter of course' and that these special spaces were 'forbidden spots, isolated, hedged round, hallowed, within which special rules obtain'

(1938[1955]:10). To choose to "play" was to enter one of these playgrounds and to follow the rules it imposed. Its use in game studies occurred after its inclusion in Salen and Zimmerman's 2003 game design textbook *Rules of Play*. The focus in their definition is on the magic circle's transformative qualities in which 'a new reality is created, defined by the rules of the game and inhabited by its players' (2003:96). The magic circle, for Salen and Zimmerman, allows for meanings to emerge from the interactions between players and games, winners and losers are created through the space's rules, as well as imbuing objects such as the King in chess with abilities and limitations it would not necessarily have outside a game. The magic circle in this context can be considered a space which reframed humans and objects into players and game pieces, produced in the new reality of game space.

Criticisms of the magic circle often focus on how a consequence of its original definition is that it is presented as a rigid structuralist imagining of the relationship between players and games, and as such is a defunct framework for discussing the performance of play as part of an external reality. For example, Mia Consalvo argues that the magic circle is not an adequate way to apprehend play as it creates a hard boundary between the play space and player's external contexts. She states that:

> We cannot say that games are magic circles, where the ordinary rules of life do not apply. Of course they apply, but in addition to, in competition with, other rules and in relation to multiple contexts, across varying cultures, and into different groups, legal situations, and homes (2009:416).

Due to Consalvo's interpretation of there being an inflexible partition between what is inside the magic circle and what is outside they argue that the magic circle is not a suitable metaphor for the interaction between players and games and instead offers up alternative frames for the discussion of game space and rules. While I find the wording in Salen and Zimmerman's definition of magic circle to be limiting, particularly where they suggest that it is 'a closed circle' in which 'the space it circumscribes is enclosed and separate from the real world', I argue that it is still a term which offers a useful perspective on game spaces (2003:95). The closed implication of the original depiction has even been returned to and rejected by Zimmerman as a misconception in a 2012 blog post. To correct the misreading of the term as having hard

borders, he asks readers to 'consider the web of relations between you and I and the Chess set as we sit and talk' where the 'games are a context from which meaning can emerge' (2012:np). The game of chess is not 'enclosed and separate' but embedded in events occurring in the world, such as Zimmerman's imagined scenario of a talk with the reader near a chess set, its existence adds to the web of relations in that space, acting he states, as a conversation starter, social marker, and aesthetic detail. Arguing that it is through the game's relations with people that the production of meaning can occur, Zimmerman's examples indicate the ways in which the chess set affects perception of another human and how the addition of rules adds restriction to how the pieces are able to move. As I argue throughout this thesis that there are other relations beyond the human-orientated ones which affect how that meaning emerges, Zimmerman's return to the magic circle ten years after introducing it to debunk the 'myths of the magic circle', aids in my own understanding of the circle, not as a closed system, but instead as a space connected with our everyday reality.

Zimmerman's placing of games as part of a 'web of relations' intersects with a key theoretical coordinate of this thesis, Karen Barad's Agential Realism. Later in this introduction I will define Barad's theory in more detail; however, for current purposes Agential Realism situates entanglements as a key component of its theory. Entanglements, Barad argues, not only connect all matter, human and non-human, but draw together all matter into a co-constructing whole – they are the relations from which all matter emerges. For Barad, 'to be entangled is not simply to be intertwined with another, as in the joining of separate entities, but to lack an independent, self-contained existence' (2007:ix). To apply this idea to the magic circle might establish games as lacking an 'independent, self-contained experience', and to be irrevocably emerging with the player as well as the external reality it is played within. Seen in this way, games, players and their material reality cannot be studied as separate entities. As such while the concept of the magic circle focuses attention on the interactions happening in spatial-temporal location a game is played within, its entanglements, as I will argue in this thesis, draw the scope of the interactions much wider to encompass material-discursive factors such as the climate crisis.

This thesis looks to understand the magic circle through the lens of the Gothic, a mode which has its own conception of how a magic circle functions. Using a Gothicised magic circle

in game studies allows the focus to shift from the demarcation of space and systems of rules to a disruption of the ontological categories in which we define who or what has agentive power in the production of space and narrative. To achieve this, I follow a line of argument put forward by Germaine in her 2022 article 'The Magic Circle as Occult Technology', where she figures the magic circle as a way of decentring the human and bringing to the surface the agency of non-human objects. The article focuses on the magic circle within the mode of live action role play (LARP) as the space within which players stay in character for the duration of the LARP, as well as player-made magic circles in horror-themed games which serve a multitude of functions, including: to summon the supernatural, protect the players from horrors, and/or transport items to other worlds. In this context the magic circle is vital for the implementing of both the gameplay and narrative rules of the game by defining in what spaces people and things have an altered form. For Germaine the magic circle is a space which 'undermines human-centred accounts of play as an activity that imposes meaning on the world and instead reveals the ways in which play is responsive to, and emerges from, a world outside, or beyond, the human' (2022:np). A similar effect is found in non-LARP Gothic texts where to form a magic circle is to recognise the agency of that which is outside human agency and experience and to then invite it to occupy the protagonist's reality. It is from these circles that witches cast spells, that demons are summoned and contained, that rituals to influence a higher non-human authority occur. To understand the magic circle in digital games from this context is to recognise the agency of the non-human elements in the production of play, to see digital games as the co-constitutors of both an intra-game and external space.

I have situated the magic circle as being an entangled entity which presents games as inherently connected to wider contexts; however, games are entities which players choose to engage with and as such the magic circle is interacted with by the player. To better understand this interaction, I turn to David Herman's *Story Logic: Problems and Possibilities of Narrative*, in which he takes a cognitive science perspective to depict how readers engage with the story world of a narrative. Herman outlines his ideas surrounding deictic shifts and how readers are encouraged to move from their current space and time to cognitively inhabit the space of the narrative. Herman explains a deictic shift as when 'narrators prompt their interlocutors to relocate from the HERE and NOW of the act of narration to other space-time coordinates –

namely, those defining the perspective from which the events of the story are recounted' (2002:271). Herman's definition describes deictic shifts as a movement from one space within the narrative into another. This can be expanded beyond the text to include the player's external reality and a game's intra-story world, offering multiple sequential shifts between these coordinates through imaginative engagement with texts. I incorporate Herman's deictic shifts as a lens to articulate the modes of player interaction with the magic circle. By thinking through these interactions as deictic shifts, I argue in this thesis that players' engagement with games is fundamentally spatial and storied, moving between spatio-temporal coordinates in a player's external reality to those in the intra-story world. The magic circle in this context presents a permeable boundary which players are encouraged to interact with when choosing to play a game in order to access the intra-story game space.

Through the use of narratology, agential realism, and the Gothic, I argue that the magic circle is a permeable entanglement from which game and player emerge as co-constructors of each other and themselves. To play a game is a choice on the part of a person, which necessitates an engagement with the game's magic circle, a prompt to move imaginatively from the spatio-temporal coordinates of a player's external reality to that of the intra-story world. The magic circle is formed out of the entanglement of both game and player, to return to Barad, they both 'lack an independent, self-contained existence'; instead, continually emerging out of the relations between them which are in the process of affecting each other through play (2007:ix). In the conclusion of this thesis I return back to this idea of the magic circle as a metaphor for the interactions which produce both player and game. The magic circle acts as a useful visualisation of my argument that playing games patterns a behaviour between humans and non-humans which could be usefully extrapolated in our interactions with the non-human beyond the realm of games. By using the magic circle as an example intersection of this thesis' theoretical coordinates in this introduction, I hope to encapsulate here their combined contributions to the overall thesis, before now moving forward to detail these elements.

Game Studies and Space

The editorial for the first issue of the journal *Game Studies* claims that '2001 can be seen as the Year One of Computer Game Studies as an emerging, viable, international, academic field' (Aarseth, 2001b). This coincided with the publication of Aarseth's essay 'Allegories of Space' which places 'the defining element in computer games [as] spatiality' (Aarseth, 2001a:154). Aarseth's argument in this essay is that games present a version of space for players to explore, but 'rely on their deviation from reality in order to make the illusion playable' (Aarseth, 2001a:169). Aarseth sees game space as being allegorical, through its visuals and mechanics the representation of space comments on the 'impossibility of representing real spaces' (169). He presents the game *Myth* (Bungie, 1998) as an example, which asks players to fight for a position in space. The game is about strategically using and occupying the battlefield while thinking about troop formations and the strengths and weaknesses of units. While the game executes the tactics of battle through its variation of spaces, hills and valleys for example, it is 'carefully crafted to offer a balanced challenge' meaning that the artificiality of game space is attuned specifically so as to build engaging gameplay rather than reflect the complexities of a real-life battlefield (168). Game space is an artificial construction rather than a naturally occurring landscape, decisions over its construction are closely tied to the mechanics of the game, its deviations from reality having an effect on how the gameplay of a game unfolds. It is these divergences from real spaces that Aarseth uses to categorise game space. The wide scope of spatial possibilities positions *Myth* as, what Aarseth calls, an 'outdoors' game, compared to an 'indoors' game such as *MYST* (Cyan Inc, 1993), which places players within a labyrinth to be navigated through choosing the correct next direction. This essay was extremely influential and helped centre spatiality as a vital element in the study of games. As I will explore, Aarseth's movement towards categorising space through its representation patterned the field's efforts to provide a taxonomy of game space. For the purposes of this thesis, it is Aarseth's notion of spaces as allegories which highlights the impossibility of perfectly replicating our external reality which I wish to draw into my work. Sacrificing elements of reality, I argue, is not only for the purpose of gameplay, allowing a player to be sufficiently challenged, but also for the purposes of narrative. Much like how stories in film and novels cannot provide a one-to-one model of "real" space, divergences occur so as to focus a narrative and to keep it moving. For example, a meet-cute in a romantic comedy creates an artificial

space in which two characters happen to encounter each other, while the corridors of a horror game, such as the *PT* demo (Kojima Productions, 2014), morphs space to force an encounter between the player and an enemy NPC.

Aarseth's efforts towards grouping games by their spatiality coincides with other academic work produced simultaneously which sought to understand space through its categorization. The taxonomy of space offered by Mark J. Wolf in *The Medium of the Video Game* is an example of this emerging trend in early 2000's discussions of game space. Wolf identifies eleven types of spaces which are structured by how the game presents on and off-screen space to the player; they are:

1. No Visual Space; all text-based.
2. One screen, contained.
3. One screen, contained, with wraparound.
4. Scrolling on one axis.
5. Scrolling on two axes.
6. Adjacent spaces displayed one at a time.
7. Layers of independently moving planes (multiple scrolling backgrounds).
8. Spaces allowing z-axis movement into and out of the frame.
9. Multiple, nonadjacent spaces displayed on-screen simultaneously.
10. Interactive three-dimensional environment.
11. Represented or "mapped" spaces. (2001:53-67)

In all these cases, discussions of space focus on how a player will view that space or how the player's avatar can navigate it, but the effect of these spaces on a player is not considered. This makes the types of space set out by Wolf utilitarian; focused on its features rather than its effects. Wolf's classification is useful for describing the types of space this thesis will encounter, 5 in *The Binding of Isaac: Afterbirth +*, 10 for both *Bloodborne* and *Death Stranding*, but also 11 occurring at points in all three. However, due to it only describing the features of a space and not its effects, its use requires augmentation to discuss how these types of spaces affect

narrative.

To provide a way of viewing the effects of game space on the presentation of narrative I incorporate the work of Michael Nitsche in his book *Video Game Spaces* (2008) in which he figures space as being made up of 'evocative narrative elements' that once presented to a player will begin the process of narrative generation. Nitsche states that:

> Game spaces evoke narratives because the player is making sense of them in order to engage with them. Through a comprehension of signs and interaction with them, the player generates new meaning. The elements that are implemented in the game world to assist in the comprehension will be called "evocative narrative elements," because they do not contain a story themselves but trigger important parts of the narrative process in the player. (2008:3)

Nitsche's definition of evocative narrative elements figures them as aspects of the game world with which players engage to create meaning. These elements are anything within the game space that can guide the player to an interpretation of what is happening on screen. While Nitsche argues that these elements do not contain a story, that each element in isolation could not impart a game's narrative, these elements are able to 'trigger' narrative generation within players. What is found within these elements are social, cultural, and personal triggers of association which give the player clues by its visual appearance and actions within the game world from which players put together a narrative. The game space is, to borrow and build on from Aarseth, 'carefully constructed' so as to offer a balance of narrative, in addition to a gameplay challenge. Wolf, Aarseth, and Nitsche provide definitions of the types of space being played, and position these representations of space as affecting the narratives generated by players. In chapter one I build on this notion of game space as integral to game narratives with the addition of narratology and spatial theory in order to develop my own framework which sees narratives as spatial and spaces as full of narratives.

A definition of Artificial Intelligence

The writing of this thesis has taken place through multiple advances in AI in both games and in the wider tech sphere. Choosing to research an area which is constantly changing due to developments in technology is a risk as the focus on a specific type of technology could result in the research becoming outdated before it has been completed. As this thesis engages in the philosophical questions raised by the inclusion of AI in games, such as how AI affects storytelling in games, rather than focusing on the minutia of the technology, my arguments in this thesis have not been left behind by new technology. I would argue that the findings of the thesis have become increasingly relevant with the addition of ChatGPT into the gaming space, as anxieties rise around the use of this technology to cancel out human involvement in the creation of games. The bubbling up of these anxieties can be seen in the writers' strikes happening as I write, which are focused on, among other things, bans on the use of AI language models for writing films and TV shows. Any new technology has the potential for harm in how it is implemented. For example, the sheer scope of technical support required to mine cryptocurrency such as bitcoin has resulted in large server farms which burn fossil fuels at such a rate to have an effect on the climate. According to the Cambridge Bitcoin Electricity Consumption Index, the mining of Bitcoin accounts for roughly 0.15% of the world's carbon emissions. Similar figures also occur for the tobacco industry and gold mining (*Cambridge Bitcoin Electricity Consumption Index (CBECI)*, n.d.). However, the production of new technology is ongoing and continuous. This is not to say I argue for the automatic inclusion of ChatGPT or other AI tech in games uncritically because new technology is always being developed. The ethical use of this tech should be considered in order to protect developers, writers, and end-users. This can only occur through vigorous interrogations of the technology and what is required to protect humans and non-humans in its uses, as well as enshrining those protections in both law as well as common practice at industry level. This thesis looks to uncover the generation of narratives as being a process which involves both human and non-human agencies, rather than something which relies on solely human creativity.

In the year I began the thesis, 2018, *Spider-Man* was released on PlayStation 4 by Insomniac Games. The game uses 'procedural tools to author content' to create a 'procedurally authored open world' (Santiago, 2019). The tools which Insomniac used helped create the 6km by 3km

space of Manhattan with its 9 districts, 544 roads, 1202 alley ways, and over 8,300 buildings, which gave designers a 'head start' and to focus on 'polishing up the world.' The language used in the GDC talk discussed here mimics the language used in many other GDC talks surrounding the use of PCG in design that position the use of AI as solution to tedious tasks and/or labour issues. Although this thesis is unable to fully touch on this as it focuses on the experience of the player and not the designer, the Spider-Man talk highlights tensions within the human/non-human relationships games produce. The contribution of this thesis is to build on this notion of games as an entanglement of human and non-human agencies, expanding it beyond artificial intelligence to encompass a wider range of examples of non-humans affecting the generation of game space and narrative.

Instead of racing technology in order to catch up with new developments in AI, I have chosen to interrogate techniques which have a long history of being included in games. In chapter two and three of this thesis I focus on procedural content generation and non-player characters, both of which utilise a game's system and code to generate on-screen outcomes. While the types of PCG and NPCs I focus on are not considered cutting edge technology, both use artificial intelligence methods in their implementation. Writing in *Procedural Content Generation in Games,* Noor Shaker et al describe PCGs as 'mostly based on AI methods' (2016:1) while Ian Millington, in his book *AI for Games* uses the terms 'AI-controlled characters' and NPCs interchangeably (2019:np). Definitions of AI vary, ranging from those emerging in academia, such as being 'concerned with intelligent behaviour in artifacts' (Nilsson, 1998:n.p), to legal definitions such as the 2023 EU AI Act which sees AI as working with 'a given set of human-defined objectives' in order to 'generate outputs such as content, predictions, recommendations, or decisions influencing the environments they interact with' (2023:39). In addition, there are examples of AI technology being unmasked as fake after the real human workers are revealed as operating the technology: '[p]rototyping the AI with human beings' has been used for chatbots and automated AI systems across many industries (Solon, 2018:n.p). Given the varied applications of the term AI, it is necessary to set out a definition to be employed in this thesis to avoid confusion between the comparatively simple technology of the games I use as case studies and definitions of AI such as John Haugeland's 'machines with minds' (1985:2).

The types of AI used in the development of games is less lofty than the artificial general intelligences present in the cultural imagination of HAL 9000 (Clarke; 1968; Kubrick, 1968) and SHODAN (Irrational Games, 1999). Millington examines this by mapping a brief history of game AI for NPCs from *Pac-man* (NAMCO, 1979) to *The Last of Us* (Naughty Dog, 2013), starting at state machines that cycle an enemy NPC through behaviours with the input of time and player action, before moving to the decision trees of Halo which provide a set of if/then inputs which regulate NPC behaviour. From this historical perspective, Millington concludes that most games 'are still using the simple AI of 1979 because that's all they need' (2019:np). As such, the definition of AI used in this thesis limits the focus to the types of AI that have been used throughout the history of the games industry. For the purposes of this thesis I define artificial intelligence in games as:

> A pre-programmed set of instructions which are implemented by a game in response to player input. The result of those instructions being acted out has a subsequent effect on the game.

Player input can be as simple as turning the game on and pressing start, or more complicated reactions to combat or dialogue. For example, the procedural content generation in *The Binding of Isaac: Afterbirth +* acts as a set of instructions to build a level which is put into effect once a player presses the start game button. Non-player characters are built on a set of instructions which control when and where an NPC can move, the animations it triggers, the dialogue said, and when it "dies" or becomes unresponsive to the player. An NPC's implementation of instructions is based on whether a player moves into range, attacks, talks, or in any other way interacts with the NPC's model. The result of the instructions being executed affects the game, usually through on-screen visuals such as the layout of the level or through the physical animations of the NPC.

This definition of AI does not cover everything artificial intelligence is currently capable of achieving. It does not, for example, discuss machine learning procedural content generation (PCGML) or large language models such as ChatGPT, which are not necessarily pre-programmed and take as their input large models of data to construct content or to 'learn' behaviour. I have chosen not to focus on PCGML and large language models as they are not currently popular techniques to use in digital games. This is mostly due to the costs and risks to implement cutting edge technology into what is, in the majority of cases, a commercial product and, to return to Millington, games do not require anything more advanced than early AI.

Recognising non-human agency: Agential Realism

This thesis seeks to recognise the agency that non-human elements enact in the generation of narrative and space. To achieve this, I refine the framework of space in digital games that will be established in chapter one, through the inclusion of Agential Realism in chapter three, a theory which engages with new materialisms to establish the importance of non-human matter. This recognition of agency informs the conclusion of this thesis, which views the non-human as co-constructors of space and narrative both within the intra-story game space as well as the external reality of the player. Whilst 'new materialisms' is an umbrella term encompassing a variety of theories and philosophies, not all of which agree, a key point of convergence is the focus on matter itself. Examples include: Jane Bennett's book *Vibrant Matter*, which argues for a recognition of the 'vital materiality' of non-humans as a motion towards cultivating more ecologically responsible politics, Donna Haraway's *Staying with the Trouble*, which offers a 'thoroughgoing materialist' understanding of human and more-than-human relationships in a time of climate crisis, and Elizabeth Grosz's *The Incorporeal*, which argues for an extramaterialism that recognises the imbrication of the ideal in worldly matters without falling back into material-ideal dichotomies. These influential works all recognise matter as being a vital part in our own human existence as well as in the world's co-construction. As Serenella Iovino and Serpil Opperman state, for new materialists 'the true dimension of matter is not that of a static and passive substance or being, but of a generative becoming' (2014:77). New materialisms see matter as active, engaged in both its own unfolding in the world and how other matter (human and non-human) emerge.

For the purposes of the thesis, I draw on the theoretical framework of agentive matter developed by Karen Barad, another new materialist, in *Meeting the Universe Halfway* (2007). There Barad introduces the concept of Agential Realism as a way of understanding how relations are structured within matter. I have chosen to focus on Barad's work due to their re-establishment of agency in all matter as a congealing force which suits the co-constructed nature of games and their spaces and narratives. In this I join other game studies scholars such as Justyna Janik (2018), Conor McKeown (2018), and Miguel Sicart (2022), who have begun to consider the implications of the new materialism for the design and study of games. In addition, Barad's continual return to the site of the science experiment, as a spatio-temporal location which involves a human participant engaging with non-human equipment, mirrors digital games as a site of interaction between human and non-human matter. Both are nested spaces wherein humans choose to engage in both observation and specific interactions via changing variables or pressing buttons. These entanglements with an external reality have been downplayed as either purely objective in terms of the science experiment, or pure entertainment in terms of games. By entanglements, a key term in agential realism, Barad is referring to the connections which form matter and meaning. To be entangled is to be inseparable from the rest of the world's matter. Much like the new materialisms of Bennett, Harraway, and Grosz, matter is a vital centralising component of Barad's framework. The first sentence of their introduction encapsulates the theory's most important tenant, that 'Matter and meaning are not separate elements' (2007:3). Instead, they are fused, as such any discussion about meaning must also consider the material elements. Writing from the viewpoint of the theoretical physicist, Barad's sees quantum physics as embedded in the matter of the world rather than as a set of equations. This thesis looks to this inseparability in chapter four, which considers the plastic which makes up game controllers as integral to how narratives are generated in games.

While matter and meaning are inseparable, they do not exist as static preconceived components placed next to others to build the world, which can then be taken apart and studied. Instead, they are what makes up the smallest unit of analysis in Agential Realism; phenomena – a swirling mixture of matter and meaning from which entities 'emerge from, rather than precede, the intra-action that produces them' (2007:128). Barad sets up Intra-actions, as a way of opposing the term interaction, which occurs between two separate

entities; rather than use the prefix inter which means between, they use the prefix intra to mean within. Intra-actions are the substance of phenomena, from which entities such as the player and game emerge. A phenomenon, a specific intra-action from within the wider phenomena, creates temporary demarcations, from which entities emerge before those boundaries are renegotiated once again, this process of becoming recurring ad infinitum. These momentary demarcations are defined as agential cuts, a cross section of phenomena which allows for the effects of intra-action to be measured, as Barad states it 'enables an […] account of marks on bodies' (2007:348). Moment to moment the boundaries between the individual elements that emerge from within the phenomena may stay the same. The glass of water on my desk does not necessarily emerge differently each minute, but, over time and/or in different spaces and contexts, the emerging matter and meaning could be different. The addition of the insights of quantum physics, as applied in Barad's work, moreover, suggests that material arrangements unfold probabilistically, rather than deterministically. This allows for the emergence of new arrangements, and new meanings, in the world's becoming.

While Barad's new materialism is a vital element to how this thesis conceptualises the relationship between the human and the non-human, there are limitations in drawing on this methodological approach. The reevaluation of the position of the human in new materialist texts such as Meeting the Universe Halfway can appear to be incompatible with such a human driven medium such as games. Agential Realism is focused on decentralising the human in discussions of the world; however, a study of games naturally has to include the human player as a central element to the creation and playing of games. This thesis is concerned with the recognition of both the human and non-human aspects of game space and narrative generation. While the majority of the work in the following chapters makes efforts to illuminate the contributions of the non-human, only relying on new materialisms threatens to make an unintentional statement that the human is being ejected from the process of play. By using Barad in conjunction with the spatial theory of de Certeau, a theory which as I have previous stated requires tempering due to its human-centric approach, the combined theoretical components reflect my intention to acknowledge the agencies of all matter involved in the generation of game space and narrative.

Discussions of the emergence of games and players from phenomena framed within such

new materialist concerns can be found in the work of Linus de Petris and Anders Falk, who describe the category of gamer and game (and the process of becoming either) when they state that: 'a gamer or a game is not made meaningful without the practice of gameplay. Becoming game(r) is a reverberation of intra-actions within the phenomena of a game' (2017:6). Intra-action is a process of becoming, it establishes momentary boundaries between entities which are always being renegotiated and consequently reemerging from phenomena. Rather than an interaction, which occurs between two entities, and which precedes their relations, intra-actions are the relations that unfold within phenomena, which then, in turn, produce the emerging entities. What is considered the game and what is considered the gamer is, for Petris and Falk, subject to a constant process we call gameplay. It is this concept, viewing play as an intra-action which is fundamental to the emergence of player and game, which I incorporate into this thesis, expanding the emerging entities to include game space, NPCs and PCG. As a result of their approach, Petris and Falk argue that Huizinga's concept of the magic circle is not a way to separate games out from everyday reality as unique objects, but instead is one example of how 'meaning is made different depending on the intra-actions enacting different agential cuts within everyday life' (2017:7). The magic circle as such delineates a specific set of intra-actions in a similar way to how the science experiment in agential realism described a different specific set of intra-actions. Petris and Falk take this to the conclusion that games are not 'subobjects of ordinary life' (2017:10), to be divided away from a perceived real and as such being studied as an individual object; instead, they are as entangled in what is considered reality as much as the world 'outside' the fictional world it generates. It is this element of Petris and Falk's work, that the game's fictional spaces are entangled within the external reality it was made and played within, which I draw on in this thesis when I refer to games as nested spaces.

Petris and Falk argue that the identity of gamer and game emerge as separate entities from these specific and unique intra-actions, that they are entangled in their becoming. However, another way of theorising intra-action in digital games comes from Justyna Janik's article 'Game/r – Play/er – Bio-Object', which sees the result of these intra-actions as producing a 'bio-object', a co-constitutive entity of player and game. Janik views Tadeusz Kantor's Bio-object, a term taken from theatre studies which describes the fusion of performer and object during a performance, through the lens of agential realism. These objects which are joined to

the performer are, for Kantor, 'not simply props or the elements of set design but [are] closely associated with the actors and the functions they performed' (Kobialka, 2009:306). Janik applies this to games, stating that when gameplay occurs it is the result of the intra-actions of a bio-object, a person fused with the video game object. Janik argues that the categories of game and player are 'constantly reconfiguring each other, but also do not exist in this form outside this connection' (2018:4). Unlike Petris and Falk who treat gamer and game as connected but separate entities once emerged, Janik joins the two in a temporary singular boundary - the bio-object – a term which she chooses to embody the entangled nature of gameplay. I agree with Janik that the bio-object is a useful way of imagining the entangled agencies of both player and game object – not as separate but as co-constructing the emergence of each other and themselves from phenomena. I draw from Janik, as well as from Petris and Falk, the notion of the categories of player and game as fluid, always being renegotiated through the intra-action of play. I expand on both their work by extending the entities included in the emergence from phenomena through the intra-action of play, to include not only player and game but other non-human entities including: game space, NPCs, PCG, and a player's external reality.

In addition to theorising how matter emerges, Barad's work provides a theory of agency that recognises the agency of non-human matter, which I will be utilising in the thesis. Often agency is grouped together with terms such as intentionality and choice, this can especially be seen in references to player agency which I will discuss in chapter three. For Barad this grouping of agency with these ideas limits what can be considered agentive, and funnels agency into deliberate actions which have reasoning attached. In order to expand what can be agentive beyond the human, Barad positions agency as being the potential for the entity to have an effect on the spacetimematter relations of the world as the world is continually renegotiated. Spacetimematter here being a term presented by Barad to join space, time, and matter into one ontological entity, agency as a result influences the presentation of the inseparable combination of these three elements. According to Barad: 'Agency is a matter of intra-acting; it is an enactment, not something that someone or something has. It cannot be designated as an attribute of subjects or objects (as they do not preexist as such). It is not an attribute whatsoever. Agency is "doing" or "being" in its intra-activity' (2007:178). It is the congealing of matter into meaning through intra-actions. It is a process which is negotiated

perpetually.

Case Studies

The three case studies selected for this investigation of human and non-human entanglements are all games made in the Gothic mode. The Gothic is a mode of narrative and affect creation that aptly demonstrates both how entities emerge from phenomena and the alternative understanding of agency Barad describes. In Gothic texts non-human elements can emerge differently via a shift of perspective when, at the point of a revelation or crisis, an object or event takes on an altered form. For example, in *The Mysteries of Udolpho*, the protagonist, upon lifting the black veil sees 'a human figure of ghastly paleness, stretched at its length, and dressed in the habiliments of the grave' (1794:662–663). She faints upon seeing what she assumes to be a dead body, but it is later revealed to be a wax figure carved as a memento mori. This is an epistemological change, as the knowledge given to the protagonist and the reader alters how matter emerges to the person viewing the figure. However, Gothic texts can offer an ontological shift in emergence, for example, the shifting transformation of the eponymous house from *House of Leaves*, where the dimensions of the house expand and collapse as the narrative continues. N. Katherine Hayles argues that the house projects a congealment of matter which 'has a terrible ferocious agency' (2008:179) that threatens the ability to quantify meaning in the text. The Gothic mode in these cases amplifies the continually renegotiated nature of emergence from phenomena, making it monstrous.

In considering the Gothic as a mode which recognises and amplifies the agentive power of non-human matter, this thesis requires a definition of the Gothic which can incorporate this alternative notion of agency. The agential realist aspects this thesis explores benefits from an addition to Baldick's definition, namely the recognition that the Gothic combines this sense of fearful inheritance in time and a claustrophobia with an uncanny shift in perceived agency. Both in "who" has agentive power in the narrative but also in how agency is perceived. Gothic texts have already offered fertile ground for discussing alternative notions of agency. Posthuman narrative theorists, such as Marco Caracciolo, use Gothic texts to explore how a shift in agency from human-focused to matter-focused can be marked through language in order to recognise the agentive power of the non-human in narratives. In his analysis of Jeff Vandermeer's 'Area X' trilogy, Caracciolo describes how Area X 'becomes deeply implicated in

[the characters'] actions and psychological states (2018:185). This space has an agentive force on the human and human-like characters in the narrative. As such, Area X emerges as agentive, affecting and being affected by the spacetimematter relations continually being renegotiated. The Area X trilogy is also an example of the ecoGothic, a subgenre of the Gothic in which interactions between humans and non-human nature erupt in ways which inspire terror and/or horror. This genre will be discussed in detail in chapter four and in the conclusion to address how its use in games affects how relationships between human and non-human nature are perceived.

Chapter Outlines

Chapter One

The first chapter, 'Building a Framework of Game Space', lays the foundations for an understanding of digital game space which throughout the thesis is continually added to and refined. It seeks to answer the first proposed research question: what is the relationship between space and narrative in digital games? A vital component of this framework is the combining of space and narrative, narratives are inherently spatial, and spaces are always storied. To highlight this the thesis's understanding of space combines narrative theory and spatial theory to produce a suitable notion of storied spaces. Game space and narrative, as established by this and developed in the proceeding chapters, emerges from the performance of both human and non-human agencies. As performance is understood in the thesis as a continual act, these agencies whose performance produces digital game space include game space itself. Thereby being viewed as an active participant in its own becoming. The result of viewing game space and narratives as produced through performance is a theoretical position which sees games as emerging from relations rather than being an individual object with which players interact. The framework developed in this chapter will be applied in the following chapters to *The Binding of Isaac: Afterbirth +* (2017), *Bloodborne* (2015), and *Death Stranding* (2019).

To establish game space as a performance, the chapter begins by drawing on narrative theory to present narrative as spatial and spaces as storied. I draw on the work of narrative

theorists such as Mikhail Bakhtin, Roland Barthes, David Herman, and Marie-Laurie Ryan who each connect the spatial with the narratological. Next the chapter moves to focus on the key philosophical underpinnings of the framework of game space, notably, spatial theory, prop theory, and performance theory. The spatial theory of Michel de Certeau aids the framework in arguing that people do not passively consume the environment around them but are active in their engagement. De Certeau's notions of space are human-focused which while helpful to position players as active participants overlooks the non-human; to temper this I turn to Kendall Walton's prop theory and Clara Fernández-Vara's use of performance theory, to view the non-human as a generative force as a way of adapting de Certeau's human-centric viewpoint of space to include the non-human as active participants. As the chapter continues, I consider how space has already been understood and categorised in readings of video games through game studies theorists. Specifically looking at how taxonomies of game space are often accompanied with a hierarchy of importance which emerges through the organisation of the presented categories. To conclude the chapter, in keeping with the explored game studies diagrams and visualisations of the spaces of games, I present my own diagram: Five aspects of digital game space and narrative, a visual aid to accompany the following chapters. Made up of Environment, Presence, Contextual Space, Narrative Generation, and Play, it is from the performed interplay of these aspects that players and digital games emerge. Each aspect presented here will be revisited in the conclusion as the development of the proceeding chapters refines how the thesis understands the aspects and the relationships between them.

Chapter Two

Chapter two, 'A Procedurally Generated Gothic', takes the framework of space established in chapter one and applies it to the unique game-generated spatiality of Rogue-like games: specifically random environment generation. The key factor in these types of spaces is that at the end of each playthrough, realised either through a player's success or failure in the previous playthrough, the game space is generated anew. This chapter and the next address my second research question, namely: how does the non-human matter of AI and space affect the narratives and spaces of digital games developed in the Gothic mode? Taking *The Binding of Isaac: Afterbirth +* (2017) as its case study, this chapter examines the use of procedural content generation algorithms as a non-human co-constructor of game space alongside the

player, which I argue provide a type of space which support the generation of narratives created in the Gothic mode. The manipulation of space through an algorithm alters the ways in which players build up spatial understanding and knowledge. In games with a singular iteration of space such as *Grand Theft Auto: V* (Rockstar Games, 2014) or *Hotline Miami* (Dennaton Games, 2012), these spaces can be committed to memory, creating a point of view which provides the observer with an illusion of power through a fiction of total knowledge. By knowing the game space, the player has power in the game, through for example, knowing locations for loot, power-ups, safe places to hide. Meanwhile a player of a game with a procedurally generated spatial structure does not have exact knowledge of a games space and as such cannot access these types of power which accompany, what I argue is, a false totality of space. Instead, procedurally generated spaces require alternative models of spatial understanding, asking players to intuit the algorithm generating the game's space. Through many playthroughs players learn the rules to the space without knowing the exact layout. These rules, I argue, are comparable to what Michel de Certeau describes as Pedestrian Speech Acts which require learning the grammar of a system to be able to write a city into existence via walking, as through play the player's exploration causes the game's spatial system to emerge.

This chapter sets out to establish that PCG and its effects on the player's relationship to space and power is a useful mechanism to assist the expression of a narrative in the Gothic mode, as its extension of spatial uncertainty mimics an uncertainty at the heart of Gothic narratives. This unique spatial structure works to enhance the Gothic coordinates established by Tanya Krzywinska, providing a potentially endless Gothic text. While a non-game Gothic narrative must reach a conclusion - films and literary texts must ultimately finish - Rogue-likes can extend the process of uncovering ad infinitum through the use of AI algorithms. As such, while *The Binding of Isaac: Afterbirth +* was selected as the case study for this chapter, similar Gothic narratives can be found in other Rogue-like games such as, *Don't Starve* (Klei Entertainment, 2013), *Hades* (Supergiant Games, 2020), *Returnal* (Housemarque, 2021), *Rogue Legacy* (Cellar Door Games, 2013), and *Crypt of the Necrodancer* (Brace Yourself Games, 2015). By using a non-human element to co-construct game space at the level of the code, these games highlight at their centre the entanglement of human and non-humans in the production of space and narrative.

Chapter Three

Chapter three, 'Recognising Non-human Agency' looks to expand the term non-player character (NPC) to include the agentive non-human matter which affects the generation of a game's narrative. This chapter interrogates the term 'character' as it is understood in game studies and narratology as often an anthropocentric term which privileges a human perspective and a concept of mind in identifying who or what can be considered a character. Only those elements which fit into the limiting frame of character are given agency over the generation of space and narrative. Combined with game studies notions of agency as being focused on the player, this has left little room for alternative conceptions of agency to emerge in the field. As such, to expand on the definition of character, this chapter utilises the theoretical framework of Barad's Agential Realism alongside the spatial theory found in chapter one, to produce an understanding of agency which I argue the Gothic mode is uniquely suited to recognise within non-human elements such as space. This notion of agency does not rely on intentionality and choice - two terms which demarcate the boundaries of game studies notions of player agency - instead this definition of agency is built around a non-human or human's potentiality to affect the becoming of the world. In this way agency is not so much an attribute of the self, but rather a continually renegotiated force which pools within elements of a game. With this alternative understanding of agency this chapter argues that for the purposes of this thesis what is considered an NPC should be extended to cover other non-human elements which affect the generation of space and narrative, specifically game space.

As a case study I utilise *Bloodborne*, an action-adventure title which is produced in a Gothic/Weird mode, moving from a fin-de-siècle Gothic of werewolves and vampires to the Weird, with eldritch entities from another cosmos dissolving previous conceptions of the game's reality. For the purposes of this thesis, I follow Jonathan Newell's suggestion that the Weird is a tumour 'growing out of the Gothic', with the two modes being considered in some ways external to each other but still sharing many similarities. Considering the Weird as a distanced relation to the Gothic, this chapter deliberately draws out the unique aspects of the Weird as a narrative mode for digital games. Specifically, that it ruptures the logic which structures the player's and/or the player's avatar's perceived in-game reality with a slowly

revealed reality which threatens or defeats a conceived human primacy. Digital games made in a Weird mode, such as *Bloodborne*, deconstruct the question of 'who' can be an agentive actor in a narrative by dispersing agency beyond the human. Moritz Ingwersen defines the Weird as breaking down the fantasy of the bounded individual and instead recognising the porous nature of all matter. The mode therefore allows for the expansion of boundaries which previously demarcated an agentive character from others and the environment. As such, with this thesis' consideration of agency, the Weird is a mode which provides fertile ground to sidestep the limiting boundaries of character and to recognise agency in all matter. *Bloodborne* opens up discussions for the city of Yharnam and the surrounding areas to be considered characters which have an agentive effect on the generation of narrative. By envisioning these spaces as characters, the entangled nature of games is brought to the surface by recognising the agency of non-human entities alongside their human co-constitutors.

Chapter Four

The final chapter, 'Beyond Intra-Story Game Spaces', seeks to establish game space and narrative to be entangled with external spaces through the climate crisis, and answers the last research question of the thesis, how are digital game narratives and spaces affecting and effected by the climate crisis? The previous chapters focus on the production of game space which was necessary as entangled space naturally invites a widening of the focus to incorporate all connecting matter due to its scope. Without an artificial cut off, in this case the intra-story game space, the exponential increase in entanglements which are connected to game space threatens to drown out any of the detail which can be found when examining the point of play between player and game. However, the final chapter looks beyond the nested interaction between an isolated player and game, to consider games as part of an entanglement of agencies in the external framing space. In particular, this chapter looks at the climate crisis as a narrative in and of itself, which marks the end of the Anthropocene and the beginning of a new story, whether that emerges as what Glenn Albrecht and Gavin Van Horn term the symbiocene (an era of living together with the environment) or an altogether more dystopian tale (2016). The ongoing narrative of the climate crisis informs the stories generated by digital games. In game space there are reflected anxieties surrounding our own relationship with the external environment. To achieve this the chapter looks at a player's Contextual

Space, as discussed in chapter one as a set of entanglements players bring with themselves when interacting with a game which affects how a game space and narrative are generated. In order to interrogate Contextual Space part of this chapter includes an autoethnographic reading on my own entanglements with the climate crisis, ecological disaster, and the case study for this chapter, *Death Stranding*. Through this reading I argue that concerns about the environment, which are impelling our engagement with all forms of entertainment and texts including in how narratives are being co-constructed.

Unlike *The Binding of Isaac: Afterbirth +* and *Bloodborne*, *Death Stranding* is not categorised as a 'Gothic game' with its Steam user-defined tags situating the game as 'post-apocalyptic', 'Sci-fi', and 'Horror' (Steam, 2022). The lack of a Gothic tag is likely due to the game not having a strong Gothic mise-en-scène or traditional Gothic protagonist. However, I argue that the game's ecophobia, its representation of the non-human, and its anxieties about human extinction, mark it out as an example of ecoGothic. Specifically, this chapter focuses on the game's representation of petroleum as associated with an imbalance of power between human and non-human forces, a negative association which powers the Us versus Them story being told through the game's cutscenes. The game presents a viewpoint of the world as being passively centered around humans, a viewpoint which may reinforce narratives of non-human passivity already contained within a player's Contextual Space from other human exceptionalist narratives found in our external world environment. The chapter concludes by moving outside of the intra-story game space to focus on the materials which make play possible: in particular the plastic in game controllers. While *Death Stranding* uses oil as an ecophobic image it is part of an industry which relies on the products of oil for its production, transportation, and the electric power required to play. As such, by engaging with *Death Stranding*, and more widely with the games industry, players are entangled in what Roman Bartosch calls a 'petroleum unconscious' which permeates all of our interactions (2019). I argue that game spaces and external spaces are linked, with the use of one space affecting the other. While this thesis does not seek to present games and the playing of them as an irresponsible activity, it does seek to frame games as part of an ongoing conversation surrounding the environment. I present the environment as a set of entanglements both human and non-human which have an effect on the stories we tell in games and being affected by the material realities of play.

Conclusion

The conclusion of the thesis re-examines the initial research questions presented in this introduction. I return to questions of how space and narrative relate in digital games, how the non-human affects the generation of narrative, and where game spaces and narratives' place is in wider entanglements such as the climate crisis. Ultimately the thesis comes to the conclusion that the process of generating space and narrative necessitates interaction with human and non-human agencies, game space and narrative being a new object that emerges from the performance of play. In addition, I argue that this interaction is not limited to the scope of an intra-story world, but as part of the everyday existence of both humans and non-humans. From that argument what emerges is the importance of our relations with the non-human aspects which are involved in the becoming of the world. By choosing to sit and play a game, players choose to engage with the non-human whether conscious of that consequence or not. With the current and future challenges which the climate crisis presents, patterning our engagement with the non-human through the interaction which occurs between player and game may lead to processes which more easily recognise the agency of the non-humans which co-construct an emerging world.

To begin I return to the diagram presented in chapter one, refining it in response to the preceding chapters. This results in a diagram reorganised from its presentation in chapter one, newly titled, 'A visualisation of nested digital game space and narrative'. The new diagram incorporates the developments of the thesis, including the inclusion of agential realism in the third chapter, as well as the widening of the focus introduced through discussions of the climate crisis in the fourth chapter. As well as retitling and reshaping the diagram as a whole, the conclusion looks at each aspect which makes up game space, Presence, Environment, Contextual Space, Narrative Generation, and Play, while noting how the work of the thesis has shifted how I define each category. Next, I look to the Gothic and the Environment, to examine how the genre mode which unites this thesis' case studies is uniquely suited for engaging with the environment. This thesis argues that the Gothic's ability to uncannily shift perceived agency results in the creation of spaces and narratives which undermine human primacy; instead, presenting an entanglement of human and non-human agencies. This shift in perceived agency aids in constructing a theoretical framework for writing about the environment and games

which looks to recognise the importance of the non-human in a medium which has been considered human orientated in both its development and how it is experienced. Finally, the thesis closes by looking forward to the implications of AI technology on the interactions between human and non-human matter. During the writing of this thesis advancements in AI, such as ChatGPT, have occurred which will likely have an effect on the production and playing of games, although exactly how its inclusion will alter games remains to be seen. Currently the technology has been used to generate code for a simple game of snake (Ammar, 2023), adapt Pokémon Emerald into a text adventure (Diaz, 2023), and write simple repeated dialogue for NPCs otherwise known as barks (Barth, 2023). While the fast pace of technological developments could threaten to outdate the thesis, I argue in the conclusion that my findings have become increasingly relevant with the addition of ChatGPT into the gaming space, as anxieties rise around the use of this technology to cancel out human involvement in the creation of games. While I argue that technology should not be blindly accepted, as the implementation of AI has a history of replicating the biases and prejudices of its developers, I argue that this thesis has looked to uncover the generation of narratives as being a process which involves both human and non-human agencies, rather than something which relies on a solely human creativity. The human and non-human are always in the process of co-constructing, whether that is as game developers or as game players.

Chapter 1: A Framework of Game Space

To begin to address the aims of the thesis an understanding of how game space is generated and experienced is required. Space, I argue, is a key component of narratives, and stories are vital in the construction of space. To evidence this statement, this chapter lays the foundations for a framework to understand game space which will continue to be developed throughout the thesis. The framework is based on an understanding of space as a performance which is continually enacted by both human and non-human actors, including space itself. In addition, it focuses on narrative as integral to space and, as such, this framework for understanding space is also a framework of narrative. As this thesis progresses, this framework is used to underpin the examinations of each case study. Through the application of this notion of space to game texts, game space emerges as the product not only of human agencies (the designers who create the games and the players who play them), but also of the non-human elements both internal and external to games. To achieve this expansive understanding of game space, I first draw on narrative theorists to demonstrate that narrative is spatial, and that space is storied. Secondly, to consider how the production of space relies on it being continually performed by human actants, I examine the theory of space proposed by Michel de Certeau (1988). To temper the human-centric notion of de Certeau's work, I apply insights from prop theory and performance theory that recognise the agentive power of non-human elements. I then move to game studies to consider how space has already been understood and categorised in readings of video games. This leads to the production of my own visualisation of the aspects which make up game space: Environment, Presence, Contextual Space, Narrative Generation, and Play. These five aspects provide the organising framework for the thesis, acting as anchor points from which the following chapters develop.

Narratives are spatial, space is full of narratives.

The framework this chapter proposes for understanding game space situates space and narrative as a single element rather than as two separate entities, with narratives being inherently spatial whilst spaces are comprised of stories which emerge from the co-constructing interactions of both human and non-human agencies. I argue that narrative is an inherently spatial mode; to read, play, or tell a narrative requires spaces both within and

external to a fictional world, and that spaces, as a result, are filled with narratives unfolding within them. As Doreen Massey argues, space is 'a pincushion of a million stories'; it is impossible to encounter space without a story embedded (Social Science Bites, 2013). To understand how narratives are spatial I draw on the work of narrative theorists: Mikhail Bakhtin, Roland Barthes, David Herman, and Marie-Laurie Ryan, who each connect the narratological with the spatial.

While this chapter states that narrative is spatial, narrative theory itself has been traditionally grounded in the temporal. In his Dictionary of Narratology, Gerald Prince's definition of narrative highlights that 'story always involves temporal sequence (it consists of at least one modification of a state of affairs obtaining at time t_o into another state of affairs obtaining at time t_n) and this is its most distinctive feature' (2003:76). According to such a definition, narrative is made up of a set of events which unfold over a timeline, one state of affairs leading to the next until the story has concluded. Narrative as a sequence of events is described as giving 'us what could be called the shape of time'; that the human understanding and experience of time is expressed within narrative (Abbott, 2002:11). This particular definition of narrative foregrounds time and reduces the spatial to an inconsequential role; although a spectre of the spatial can be found in the metaphors used in discussions of 'the *shape* of time' (Abbott, 2002:11, emphasis my own).

The above definitions focus on narrative as it is found in literary texts. However narrative theory, Marie-Laurie Ryan argues, was conceived 'as a field of study that transcends discipline and media' (2006:4). When Ryan talks of narratology's conception, she is specifically discussing issue eight of *Communications,* published in 1966, to which Roland Barthes, Claude Bremond, and Gérard Genette all contributed. Barthes in 'L'Analyse structural du récit,' translated as 'Introduction to the structural analysis of narratives,' provides a definition of narrative which moves beyond limitations of written texts: 'The narratives of the world are numberless […] Able to be carried by articulated language, spoken or written, fixed or moving images, gestures, and the ordered mixture of all these substances' (1977:79). Narrative becomes not only temporal but also spatial when the ways in which stories are communicated is included in the definition. The external world that the narrative was produced and experienced within is written into the definition of narrative, as well as the addition of anchors in the external world such as 'fixed or

moving images' and 'gestures' also becoming part of narrative's definition. I argue that this move to spatiality of narrative through reference to the spaces in which they are made and enjoyed can be seen in game spaces as the spatiality of games occurs not only in the intra-story narrative but also through the ways games are entangled with the external reality they are developed and played within.

While the spatial can be found in Barthes' 1966 definition of narrative as well as in the spatial metaphors used in other descriptions, the movement which sort to identify space as an important aspect began in earnest in the 1980s onwards with Gabriel Zoran's essay 'Towards a Theory of Space in Narrative', and continued in the work of David Herman in *Story Logic* (2002), and Marie-Laure Ryan et al in *Narrating Space/Spatializing Narrative* (2016). 'The existence of space', Zoran argues, 'is pushed into a corner […] not altogether discarded, but neither does it have a recognized and clear-cut status within the text' (1984:310). The work of these narrative theorists is not to prove that narrative is predominantly spatial, but to allow proper consideration of space alongside time in discussions of narrative.

These theories do not intend to prove that narrative is not predominantly temporal, as 'space is not necessarily an absence of time' (Zoran, 1984:312) but rather it includes spatiality alongside temporality within discussions of narrative. Space and time are both significant to the definition of narrative, which Monika Fludernik identifies as, 'a representation of a possible world in a linguistic and/or visual medium, at whose centre there are one or several protagonists […] who are existentially anchored in a temporal and spatial sense' (2009:6). By identifying narrative as 'a representation of a possible world', Fludernik embeds the spatial into the definition whilst also adding a sense of perspective as the protagonists are placed into the centre, held by both the temporal and the spatial.

As Fludernik's definition suggests, the temporal and the spatial are connected, an idea that is central to Mikhail Bakhtin's essay 'Forms of Time and of the Chronotope in the Novel', where he argues that 'in literature and art itself, temporal and spatial determinations are inseparable from one another' (1981:243). This is embedded into the definition of the chronotope as Bakhtin argues:

> We will give the name chronotope (literally, "time space") to the intrinsic connectedness of temporal and spatial relationships that are artistically expressed in literature. […] In the literary artistic chronotope, spatial and temporal indicators are fused into one carefully thought-out, concrete whole. Time as it were, thickens, takes on flesh, becomes artistically visible; likewise, space becomes charged and responsive to the movements of time, plot and history (1981:84).

The establishment of the chronotope brings both time and space into a relationship with each other which Bakhtin describes as inseparable. Bakhtin uses metaphorical language in the description of what happens to the temporal and the spatial in literature. 'Space becomes charged and responsive' (1981:84), able to change in reaction to actions and events happen within it, suggesting that space is not a static entity which is either passively encountered or simply instrumental. Instead, space is agentive, a participant in its own becoming moment to moment, an integral part of the events Prince argues are so vital to the definition of narrative.

Although Bakhtin's work on the chronotope is focused on the novel, aspects have already been applied to digital games in Huaxin Wei, Jim Bizzocchi, and Tom Calvert's 'Time and Space in Digital Game Storytelling' which present time and space as 'two aspects that complement and reference each other' (2010:2). The article presents the two aspects as working 'together to anchor textual, visual, auditory, and other interactive cues […] from which game players can build their mental story world' (2010:21). Game worlds contain a combination of the temporal and the spatial to present a narrative to players and as such can be used to examine the effects of chronotopes. However, they present the temporal in games as 'fuzzy' which 'help create plot variations and thus breaks the linearity of story' (2010:21). In this assertion, Wei, Bizzocchi and Calvert refer to the temporal coordinate of a game as pausing between plot points, with time usually not meaningfully progressing until the player achieves a certain goal within a space. In a similar way, Bakhtin argues that Greek romance narratives stop time between the inciting incident and the resolution, allowing for example 'the heroes meet each other at a marriageable age, and at the same marriageable age, no less fresh and handsome, they consummate the marriage' (1981:90). All possible incidents which occur between those two events (which both occur in the same space of the hero's homeland), for example: shipwrecks,

pirates, prison, being sold into slavery, their presumed deaths, fill up 'time-sequences that are neither historical, quotidian, biographical, nor even biological and maturational' (1981:91). I synthesise this notion of time as tied to narrative events built into a story's space into my own framework of space as a way of understanding time in games. Rather than envision time in terms of linear progression, where time continually moves forward, in game narratives time moves in relation to narrative events, not advancing until players complete specific actions. A similar conclusion is drawn by Michael Nitsche when discussing how games provide an alternative timeframe for the hero's journey to unfold, rather than the structured pace seen in most films and novels to which the monomyth is applied. Nitsche states that 'The spatial exploration of a video game world via movement depends on the player's participation, which generates a unique timeframe and event realization' (63). How time flows in game narratives is based on spatial exploration and the actions which players take within that space.

Bakhtin's discussion of chronotopes is concentrated on the spatial and temporal reality found within literary texts. However, chronotopes have also been discussed in relation to the world outside of the text. Roderick Beaton argues that 'the chronotope emerges as also being the relation between that imagined world and the real, historical world, similarly constituted […] out of a perceived relation between space and time, at the point in historical time where the work is either written or read' (2010:62). The world found within the novel is not divorced from the world that produced the text and the world in which it is then read. Multiple chronotopes overlap in the creation of fictional text, in digital games the player navigates these intersections between intra-story world and the external world.

The process of navigating the intersections produced through multiple chronotopes might be understood in the terms set out in Deictic Shift Theory (DST). Proposed by Erwin M Segal (1995), DST explores the distance between the spatiality and temporality of fictional texts and the world outside from the perspective of the reader. Words described as deictic contain a fixed meaning, such as 'I', 'you', 'here', and 'now', that are dependent on context for complete understanding. Segal examined the ability for the current deictic context experienced by the reader to shift to fictional alternatives in his essay 'Narrative Comprehension and the Role of Deictic Shift Theory', where he seeks to show that:

> when one reads a narrative as it is meant to be read, he or she is often required to take a cognitive stance within the world of the narrative […] DST is a theory that states that the deictic center often shifts from the environmental situation in which the text is encountered, to a locus within a mental model representing the world of the discourse (1995:15).

By interacting with texts, readers inhabit an imagined perspective which is different to that which they typically inhabit outside of the text. This imagined perspective is the aspect, Presence, which I will raise later in my diagrammatic schema for understanding digital game space. Presence describes the way in which a player is situated simultaneously within the game and in the real world outside of it. A shift between the world outside the text to the space within is the act of immersion which Janet Murray describes as, 'a metaphorical term derived from the physical experience of being submerged in water' (1998:124). The difference, for Murray, between being surrounded by water and being surrounded by air is enacted as 'we enjoy the movement out of our familiar world', initiating a desire for immersive experiences (124). Immersion is the result of a mediated shift between two differing spatial and temporal coordinates, which I argue allows players to act within both; pressing a button outside of the text to state their presence within the game. Proponents of DST might argue that immersion is achieved by the narrative signposting a difference between the coordinates of time and space which the reader occupies, and the coordinates of the game. Segal continues that 'such terms, which directly implicate the context include I, now, and here. These refer to the person, time, and place of the speech act' (1995:10). In literary texts, words which signify a specific time, place, and perspective invite readers to inhabit a certain role within the novel, as a result, a reader is encouraged to imaginatively travel between these coordinates. While in games the I, now, and here equivalent is to the avatar of the game, the temporal setting, and the game space, which similar to literary texts invite players to inhabit a certain perspective and role in the game's narrative. For example, *The Binding of Isaac: Afterbirth +* asks players to inhabit the perspective of Isaac, in the unending space below his family home in the late 1980s early 1990s in the moments after Isaac's mother begins chasing him with a knife. For games with a fantasy setting, such as *Super Mario 3D World* (Nintendo, 2013), the now which games ask players to relocate to is often unanchored to anything established in the real world (unlike *The Binding of*

Isaac: Afterbirth +'s late 1980s/early 1990s America), in which case the invitation to move to the game's now is simply an invitation to move away from the player's here and now, disjointed from any current external reality structures for measuring time and space.

Herman (2002) also refers to the idea of deictic shifts when discussing the creation of storyworlds, arguing that 'storytelling involves a shift of deictic centers, whereby narrators prompt their interlocutors to relocate from the HERE and NOW of the act of narration to other space-time coordinates – namely, those defining the perspective from which the events of the story are recounted' (2002:271). Herman's definition highlights that this movement is towards the coordinates of the entity narrating the story, in this way deictic shifts are not simply a shift from the chronotope (space-time) of the reader to the chronotope of the text, but also the process whereby storytellers present an entity for the reader to inhabit within that specific location. Readers occupy a point of view when immersed in a text: this is supplied by the narrator and it provides the reader not only with a space-time coordinate but also a role, a perspective, to inhabit.

Shifting between these coordinates can encompass either a movement towards the world of the fictional narrative or a movement away. Peter Stockwell examines the different types of movement between the coordinates as either a 'push' or a 'pop'. His definition of a push is where 'a novel which begins with the deictic field centered on a narrator might shift its deictic centre 'down' to a point earlier in the narrator's life, or to a different spatial location, or even to the deictic centre of a character in the novel […] this type of deictic shift is a push' (2002:47). The act of a player entering a game world by picking up a controller and pressing start is the first 'push' into a game's narrative as they are choosing to engage and begin narrating through play. So, too, are any changes of the avatar during play, or a change of perspective such as first-person to third-person. The opposing movement or shift is a 'pop': 'You can pop out of a deictic field by putting a book down and shifting your deictic centre back to your real-life level as real reader' (2002:47). According to Stockwell, pops can also be experienced within a text if 'the narrator appears again at the end to wrap up the narrative, or if the narrator interjects opinion or external comment at any point within the narrative' (2002:47). As the player is often narrating their own playthrough of a digital game, a pop occurs most often for players during cutscenes, movement from the game to a menu, inventory screens, and loading screen

between levels or unconnected spaces. Much like how choosing to engage with a game 'pushes' a player into a game, putting down the controller and turning off the console is a 'pop' out of the game's narrative. Shifting the player's deictic centre back to themselves in their external reality.

Although Herman and Stockwell provide useful language to describe the direction of imaginative travel for a player, it provides levels of deictic fields which appear to be arranged in a linear hierarchy. Pushes happen down towards the fictional, and player's pop up towards "reality". According to such a model, players are only able to occupy one 'level' at a time; physically inhabiting reality and pushing themselves imaginatively into the narrative before popping back to the external world. To address this linearity, my framework incorporates these levels alongside Herman's notion of the ontological interference pattern, which allows for the simultaneous occupation of multiple levels. Herman defines ontological 'interference patterns' as being 'produced by two or more interacting spatiotemporal frames – none of which can be called primary or basic relative to the other(s)' (2002:345). The player acts as a connecting point between the fictional and the real, as this relational point I argue they interact within their own Contextual Spaces, a term I will explore later in the chapter but which, in brief, is a set of entanglements human and non-human which are vital components in the production of a digital game's space and narrative. Segal also gestures towards this in a discussion of available communication theories he uses to ground DST, when he states that, 'a major data source of the intended message resides in hearers and is not delivered by the text' (1995:8). Players create a link between both coordinates rather than exclusively moving between them, which results in the player's external world's context becoming tangled with the digital world. The player may have been brought to the coordinates of the text but from that point they are still able to influence their own understanding via the context they are able to bring to the game world.

Being able to inhabit multiple coordinates, both the intra-story world and external reality, requires that a player must be present in both spaces. In my framework I use 'Presence' to describe player placement within a game space to invoke connotations of a digital bodily existence within a text, suggesting that players are present within the game text during play and can then interact with that space. However, narrative theory has already produced terms

which theorise the positionality of characters, narrators, and readers, such as point of view, perspective, and focalisation. Through an examination of these existing terms, I suggest the limitations of their use in the analysis and design of games. Classical terms for the positionality of characters, narrators and readers are not applicable to the unique narratives of games, due to play combining the roles of narrator, player, and protagonist. When interacting with games players are often placed into the role of the spectator as they observe the narrative unfolding on screen, as well as the role of the leading character in the story through the avatar they inhabit, whilst also performing the story through their interaction with the controller. By positioning players as taking on all three roles, narrative theory, which has traditionally focused on novels or films, needs to be adapted to fit digital games' mode of storytelling. It is through adapting theories of narrative to games, David Punday argues, which 'allows us to see complexity and unexplored potential in common narrative concepts' (2019:18). Adapting the theorising of positionality provided by narrative theory highlights the positioning of characters, narrators, and readers as an inherently spatial act which transcends the boundaries between the intra-story world of the game and a player's external reality when players occupy multiple roles.

In 1943 Cleanth Brooks and Robert Penn Warren chose the term 'focus of narration (point of view)' which they defined as 'who tells the story'. They distinguish four variations:

> (1) a character may tell his own story in the first person; (2) a character may tell, in the first person, a story which he has observed, (3) the author may tell what happens in the purely objective sense – deeds, words, gestures – without going into the minds of the characters and without giving his own comment; (4) the author may tell what happens with full liberty to go into the minds of the characters and to give his own comment (1943:511).

These variations consist of points of view that present an internal view, detailing the inner thoughts and feelings of characters (found in 1 and 4), and those that provide an external view, which cannot access the thoughts and feelings internal to those the story is about (found in 2 and 3). However, the difference between the two options which provide an internal view (1

and 4) and the two options which provide an external view (2 and 3) is that of expression, the point of view is the same but the entity which expresses that point of view is different. In his critique of Brooks and Warren Gérard Genette argues there is a confusion between:

> the question who is the character whose point of view orients the narrative perspective? and the very different question who is the narrator? – or more simply, the question who sees? and the question who speaks? (1983:186).

Genette argues that the confusion lies within the questions being asked during the making of the typology. Point of view for Genette is a legitimate aspect of narrative for analysis, however it is not a term able to hold both the questions 'who sees?' and 'who speaks?' since, for Genette, the narrator – or who speaks – is not necessarily a point of view character within the narrative. For the analysis of digital games, the question that Genette raises that is most significant is 'who sees?'. Two reasons influence this. First, the question of 'who speaks?' fails to account for the shift from speech to action, as it is more a question of who acts or who interacts that becomes relevant during play. Second, in digital games who sees is often also who speaks (or who acts). The ways in which players are present within digital games is often tied to concepts of player agency and the ability to enact change onto the game's world.

To solve the problem that he identifies in Brooks and Warren's taxonomy, Genette choses the term 'focalization'; a term which he admits to being 'slightly more abstract', but he chooses so as to 'avoid the too specifically visual connotations' (1983:189) found in terms such as point of view. Genette's definition of focalisation is decidedly knowledge based, with the *Living Handbook of Narratology* defining the term 'as a selection or restriction of narrative information in relation to the experience and knowledge of the narrator' (Burkhard Niederhoff, 2014). The choice to understand the positionality of a narrator in a story through the information that they have and don't have, mirrors Michel de Certeau's notions of spatial knowledge and the production of space, which I will come to later in the chapter. In both cases knowledge is a driving force for how narrative and space is presented, underscoring my earlier argument that space and narrative are an entangled entity.

In defining focalisation, Genette lists the possible types that he has identified. The first type is 'nonfocalized narrative, or narrative with zero focalization. The second type will be narrative with internal focalization […] our third type will be the narrative with external focalization' (1983:189-90). He also offers variants of both the internal and external focalisation via the number of potential characters who can focalise the narrative. To provide the structure for these types of narrative, Genette looks to Tzvetan Todorov's 'Les catégories du récit littéraire' published in *Communications* in 1966. In this article, Todorov applies formulas to understand the relationship between the narrator and the character. These are expressed as Narrator > Character (zero focalisation), Narrator = Character (internal focalisation), and Narrator < Character (external focalisation). Narrator > Character is where 'the narrator knows more than his character. He does not care to explain how he acquired this knowledge: he sees through the walls of houses as well as through the skull of his hero' (2014:407). The narrator is omniscient, able to know both objective facts about the world and the subjective feelings of the characters. Narrator = Character is where 'the narrator knows as much as the characters, he cannot supply an explication of events before the characters have discovered it' (2014:408). The narrator here could be the character itself or an entity external to the character, but the amount of knowledge stays the same. Finally, Narrator < Character is where 'the narrator knows less than any of the characters. He can describe only what he sees, hears, etc., but he does not have access to any consciousness' (2014:408). Todorov argues that this is rarely seen in literature but still includes it as a legitimate possibility for narrative. To apply Genette's ideas to digital games, in the majority of cases, the player is positioned as part of an internal focalisation. The player has the same knowledge about the game's space and the unfolding narrative as the avatar they are controlling. There are examples of games which present external focalisation, for example, *The Binding of Isaac: Afterbirth +*, pairs the player with a 'new' Isaac each playthrough while *Returnal* puts players in a position where they are piecing together Selene's past and present through multiple playthroughs. The player's positioning can also alter over time, with replays of a game generating a narrative where the player knows more than the character. A result of this application is the positioning of player as narrator who enacts these relationships via the process of playing.

Presence, for this thesis, is ultimately the position within a game's space and narrative that

a player inhabits during play. In this way I am drawing from Ron Tamborini and Nicholas D. Bowman's idea of spatial presence which they argue 'is best understood as the sense of being physically located in a virtual environment' which they argue digital games are 'tailor-made' to achieve (2010:88). Their notion of spatial presence focuses on a feeling of being involved in the game world and able to act within it, with games able to imbue an interactivity which is not found in other narrative mediums. I would build on this through the argument this chapter has put forward that space and narrative are an entangled entity, with spatial presence also being a narrative presence. The player is narrating by interacting with the world. Presence affects not only the visuals presented to the player (first-person and top-down give very different visuals), but it also affects the tone of the game world, how the player is expected to feel about a space. Tone and genre are expressed through presence in a similar way to camera angles in film, a Gothic horror game from a player = avatar perspective fragments the player's spatial knowledge, which changes a player's interactions into ones of distrust and fear. In comparison a player > avatar perspective, allows for a seemingly comprehensive view of the space. However, such a point of view presents a false totality. The view is seductive, but the player can never have access to full spatial knowledge as it cannot be contained by a singular subject and is partially hidden within the code. I will expand on these tensions revealed by game perspective in chapter two as part of my discussion of the power afforded by spatial knowledge. For now, the important point about Presence is that the position of the player in relation to the avatar informs the amount of knowledge that a player has about a space, which in turn changes the way players generate narrative. The relationship between the player's presence and the space viewed therefore is critical to the comprehension of narrative in digital games, which further presents space and narrative as entwined entities which should be considered as inseparable.

Michel de Certeau and spatial theory

Narratives and spaces are, as I have suggested above, entangled concepts. This claim has been made already in other fields of study, such as spatial theory. The example this framework draws upon is Michel de Certeau's *The Practice of Everyday Life* (1988), which presents consumers of media and walkers of cities as being similar in terms of the production of the texts they inhabit. The main aspect of de Certeau's work that informs this thesis is his contention that people do

not passively consume the environment around them but are active in their engagement. In other words, everyday actions performed by people change their environments. This viewpoint on the production of space posits the human as a part of the interactions which build city spaces, a notion which can be applied to digital spaces. In discussing spaces and humans, De Certeau identifies people as 'users' or 'consumers', terms which connote a purely instrumental view of space as the environment is either used or consumed for the benefit of its inhabitant. I will not be taking forward de Certeau's choice of language to describe the player as I do not wish to replicate this notion of space as a resource. Instead, the account of space that follows incorporates de Certeau's understanding of space as text, his argument that spatial perspective alters approaches to space, and his positioning of users as both readers and writers. I argue that these theories can be mapped from 'user' to 'player', and from the physical spaces de Certeau focuses on to those found in digital games, as both types of space provide the player with the ability to interact with their environment through movement.

The definition of space offered by de Certeau provides insight into his position on the relationship between people and the built environment, which is instrumental in the theorising of a digital equivalent. It should be noted that de Certeau's definition of space differs from those such as Yi-Fu Tuan, in that de Certeau understands place as a language's theoretical structure, and space as that theoretical structure spoken out loud. Instead Tuan sees space as empty of attachments until imbued with identity through the addition of 'memories and dreams', when it becomes a place (1977:164). As discussed in the introduction this thesis takes its definition of space from Doreen Massey, who sees space as already storied and created out of the relations which populate itself and place as a specific example of space. However, de Certeau's notion of space is useful for tracing the entanglements between humans and their environment. De Certeau takes cities – areas of high human population and high human-environment interaction – as the focal point of his argument. This interest in the interaction between humans and their environment is illuminated in de Certeau's statement that, 'a space exists when one takes into consideration vectors of direction, velocities, and time variables. […] Space occurs as the effect produced by the operations that orient it, situate it, temporalize it' (1988:117). There is a strong link, de Certeau argues, between the existence of space and human perspective; space only exists when human understanding is at play. De Certeau argues that '*space is a practiced place*', that a city allows for a high concentration of interactions which

produce space (1988:117, emphasis in original). He offers the street as an example which 'defined by urban planning is transformed into space by walkers' (1988:117). Without walkers occupying the street the space ceases to exist. In other words, space is the result produced only after human interaction has occurred. This notion of space is anthropocentric and constructivist as the 'matter' of space only emerges out of human activity. This is in tension with the thesis' intentions of examining the entanglements between non-humans and game space and narrative, as such I will be tempering de Certeau's anthropocentrism as this chapter continues with insights from prop theory.

Movement as a form of interaction, and its effects on producing the city coalesce in the chapter 'Walking in the City'. Here, de Certeau draws the three aspects together as an example of a text being created. He looks at the city as 'the most immoderate of human texts', those that are above the city are able to look down and read it; the act of reading becomes an extravagant and salacious act, de Certeau asks 'to what erotics of knowledge does the ecstasy of reading such a cosmos belong?' (1988:92). The opportunity to read a space in this way is, he argues, seductive; however, this view offers a false totality, as the viewer is unable to perceive everything. Those who find themselves in the streets of the city are unable to read the whole, says de Certeau, they provide a fragmentary view, tracing the streets like 'thicks and thins of an urban "text"', their seemingly blind movements through the city 'compose a manifold story that has neither author nor spectator' (1988:93). The city, for de Certeau, is a text that is decisively human created, and as such his theory is particularly interested in spaces which are human occupied and built. While viewing the city from above is a tempting proposition the production of space emerges from pockets of fragmented knowledge garnered from the process of moving and living within that space, rather than seeing it in a false entirety.

Digital games share similarities with de Certeau's perspective on cities, as games are human designed media which require human participants to pilot the experience from beginning to end. De Certeau's work has already been used in this way in game studies by Karla Theilhaber, who argues that movement through an area in a game defines its spatiality. She states that; 'by moving her avatar in the game, the player creates the game space; or […] by changing or moving her viewpoint onto the game space, the player creates space' (2019:64). Theilhaber argues that by enacting movement within a game a player constructs space in the same way

that de Certeau argues space is created. The player, then, is a 'user' acting within their environment. Theilhaber draws particular attention to the distinction de Certeau marks between the act of 'seeing' and 'going', responding to his claim that there is either 'seeing (the knowledge of an order of places) or going (spatialising actions). Either it presents a tableau ("there are…") or it organizes movements ("you enter, you go across, you turn…")' (1988:119). De Certeau places these two terms within a shifting scale, in which descriptions of a space move between: observations of the contents (the listing of nouns) or descriptions of movement (the use of verbs). In her writing on digital spaces, in which 'seeing directly communicates with walking' (2019:63), Theilhaber regards both elements, 'seeing' and 'going' as connected with movement directly connected with the act of seeing. For the understanding of digital game space in this thesis, de Certeau's work, and Theilhaber's use of his theory in game studies, provides a useful analogy between space and language. I return to this idea in the next chapter to describe the relationship between players and the building of spatial knowledge, describing this process as one of learning grammar in AI manipulated spaces through the example of roguelikes.

While digital games are human designed media which require human participants to pilot the experience from beginning to end, this thesis explores the non-human as a co-constructor of space. As such, de Certeau's framework of space comes to be limiting in that it does not account for the agentive power in which non-human elements are vital to the production of space; instead, suggesting that they exist as part of a text which is created via human interaction. Space is a product of human activity in this view rather than, as I argue through the use of posthuman performativity in chapter three, constructed moment-to-moment through an entanglement of agencies both human and non-human. Responding to this, it is at this moment that I will draw on theoretical positions which view the non-human as a generative force as a way of adapting de Certeau's human centric viewpoint of space to include the non-human as active participants.

To achieve this, I draw on Kendall Walton's theory of make-believe which looks to props as a way of theorising the generative power of the non-human. Walton observes that 'Children may play a game in which bicycles are horses, and a garage is a corral. […] I call the bicycles and the garage props. Facts about them generate fictional truths' (2014:92). The non-human,

in this case the space provided within the garage and the objects contained within, transform to produce a set of fictionalised meaning that is vital in the production of the space and narrative of the children's game. This idea can be easily transferred to digital games which use the non-human as generative props to produce a game's space and narrative. Chris Bateman uses Walton's make-believe theory in his book *Imaginary Games* to consider how objects in games produce narrative. He states that 'both the car we see at the movies and the car we see in the racing game might be considered *virtual* props - although we perceive them, they have no physical basis as we perceive them' (2011:94 Emphasis in original). Regardless of the object's physicality or virtuality they can be considered props for the generation of a fictional world. For example, digital objects such as a key generates fiction truths which can be found not only in their practical functions for gameplay [picking up a key to open a door] but also for their narrative capabilities [the key looks particularly old and rusted – the game world is old and disused]. In this way space and narrative are produced through interactions with these digital objects. As I will argue in chapter four, this view of the non-human as generative expands beyond digital objects, such as in game keys, or physical objects, such as Walton's bike and garage, extending to the amalgamation of entities and agencies, such as those comprising the climate crisis. The environment in crisis, I will come to argue, affects the ways in which the intra-story world of the game and the external reality of the player merges, much like an in-game key affects how narrative and space in the game are produced.

Thinking of the non-human through the concept of the generative prop emphasizes their agency within the production of space and narrative. In terms of considering space as a text, the playing of a digital game becomes akin to a performance, acted out by both player and the game, inclusive of the non-human 'props'. That game spaces are performances is an idea already apparent in Game Studies. For example. Clara Fernández-Vara looks to theatre studies as a means of thinking through digital games in a way which discusses the production of space. She states:

> The separation between real space and performance space may seem clear, since the performance space is represented on the screen, and does not exist in the real world. However, the videogame space must also extend beyond the screen—the input of the

> player (from keystrokes to shaking the controller) takes place outside of the represented digital space (2009:3).

The line between performance space (taking place on a screen) and real space (everything external to the screen) is blurred through the necessity of the player acting outside of the game to affect the intra-story world. In chapter four, where the focus of the thesis is extended from the intra-story worlds of digital games to the entangled nature of games with the world outside, this extension of performance space to include actions external to the visuals on screen provides a pathway for considering games as a part of external everyday reality. Fernández-Vara goes on to state that 'Videogame players are thus both performers and spectators', a comment which echoes Theilhaber's statement that players are both seeing and going, observing the space and producing it. The positioning of players as performers and observers, I will argue in the conclusion, patterns our interactions not only with games but also the environment.

Fernández-Vara's notion of games as performance uses the ideas of Richard Schechner in his book *Performance theory* in which he discusses games and play directly. Schechner argues that:

> Sometimes, as in theater and children's play, they are decisive in creating the symbolic reality. The "otherworldiness" of play, sports, games, theater, and ritual is enhanced by the extreme disparity between the value of the objects outside the activity when compared to their value as foci of the activity (2003:11).

Theatre, and, I would argue, games, transform non-human objects within their spaces so that new meanings and values can emerge from our interactions with them. In the next chapter's case study, *The Binding of Isaac: Afterbirth +*, pixels on a TV screen alter to become a basement, while ordinary household objects picked up within the game are transformed into power-ups or enemies. The non-human affects what Schechner calls 'symbolic reality', which I apply to

digital games to view the performance of game space as a transformative process which alters the 'value' of the non-human aspects co-constructing game space with the player to produce both space and narrative.

Game studies and taxonomies of space

Game studies is a field which has emphasised digital games as being primarily characterised by spatiality. Espen Aarseth claims that space is central to our understanding of digital games:

> The defining element in computer games is spatiality. Computer games are essentially concerned with spatial representation and negotiation; therefore the classification of a computer game can be based on how it represents or, perhaps, implements space (2001:154).

Creating a taxonomy of game spaces specifically determined by the ways in which players interact with spaces, according to Aarseth, is a crucial part of a game's marketing and categorisation. Games are, for example, likely to be described in terms of spatially oriented categories such as: first-person shooter, third-person action-adventure, and isometric dungeon crawler, all include an indication of the gameplay to be expected but also 'how it […] implements space'. Traditional labels such as 'horror', and 'science fiction', typically used to differentiate films or novels, are either considered secondary or overlooked as Geoff King and Tanya Krzywinska suggest:

> The nature of these distinctions is different from those found under the heading of genre in film, a reflection of some of the central differences between the two media. Genre is used in games to distinguish between broad categories such as 'action-adventure', 'driving', or 'strategy.' (2002:26)

These categories relate to gameplay, the types of actions that a player will perform and how

they will interact with the space around them; whether that is using the controller to operate a car or to place troops onto a battlefield. Games, however, are not defined only by gameplay, as King and Krzywinska note, 'another level of distinction can be made according to the mode in which the game-world is experienced by the player. Action adventure and driving games, for example, might be available in first-person or third-person mode' (2002:26). In this instance, 'mode' is the relationship between the player and the game space, the perspective that the player embodies to view the events happening around them. These combinations of genre and mode are used in game marketing as a way of quickly communicating to potential players how they will navigate the game space. Extended use of these categories in marketing materials and reviews signals to players both the specific perspective that a player will be occupying throughout play and the interactions possible within such a space.

Beyond considering the marketing of game genres and modes, game studies' theorists have provided other ways of categorising games in spatial terms. Below, I outline some of these categorisation schemas that contribute to my own understanding of game space and the framework I am building. A key schema is provided by Mark J. P. Wolf, who describes eleven ways in which games present on-screen and the extradiegetic off-screen spaces. These are:

1. No visual space, all text-based.
2. One screen, contained.
3. One screen, contained, with wraparound.
4. Scrolling on one axis.
5. Scrolling on two axes.
6. Adjacent spaces displayed one at a time.
7. Layers of independently moving planes (multiple scrolling backgrounds).
8. Spaces allowing z-axis movement into and out of the frame.
9. Multiple, nonadjacent spaces displayed on-screen simultaneously.
10. Interactive three-dimensional environment.
11. Represented or "mapped" spaces. (2001:53-67)

These eleven instances of game space are organised through the various ways that a player perceives and interacts with a game. Moving from the non-represented written text

adventures, through to represented spaces moving in complexity from singular screens in *Minesweeper*, to large, mapped spaces in *The Elder Scrolls V: Skyrim*. The ordering is deliberate as Wolf states:

> They are presented here in order of visual and conceptual complexity, each requiring varying amounts of concentration from the player; unlike the film viewer, who is led (visually) through the film's diegetic world by the film's characters, the video game player has a stake in the navigation of space, as knowledge of the video game's space is often crucial to a good performance. (2001:53)

That games are a spatial medium means, for Wolf, that an increase in complexity of spatial presentation equals an increase in complexity of the game. His categorisation of game space is concerned with how each type of space is functionally presented to the player, not in how the narrative or the player's experience of it is then affected. Wolf's focus is on how an understanding or mastery of the game space can lead to playing the game 'better' and more efficiently, a view which emphasises the ludic qualities of a game (including how to achieve the lusory goal, and the conditions for winning or losing) rather than the relationship between space and narrative. Mastery of a game, for Wolf, is accompanied in the majority of cases by spatial mastery and as such an encompassing knowledge of the game's space. I take from Wolf's work the inseparability of game space with other aspects of games; however, rather than mastery I look to incorporate space as inseparable with narrative. This thesis takes as case studies games with what Wolf considers complex spatialities, in my own analysis I look to problematise spatial knowledge as correlating directly with a 'good performance' or mastery over a game. Mastery of a game space through knowledge is a false totality, regardless of the vantage point over a space, as total knowledge is not a possible outcome and therefore mastery is not achievable through spatial knowledge. As the earlier discussion of de Certeau identified, cities are produced through multiple fragmentary knowledges of spaces rather than a singular mastery. Digital game spaces, I argue, equally cannot be known completely, with spatial mastery being impossible to achieve. As such game space does not elude mastery, as a game can be completed, but rather completing a game does not exhaust the meaning or

possibility of a game space.

Other taxonomies of game space include that offered by Dariusz Jacob Boron, who takes a historical approach in 'A Short History of Digital Gamespace.' Boron argues that narrative 'is a story or a tale communicated via word of mouth or written text' and as such his spatial categories are similar to Wolf's (2007:26). Both Boron and Wolf identify the effect on gameplay and the difference between the types of spaces, including technological advancements within the same category such as 'spaces that scroll along one axis' and 'scrolling with multiple background layers' (2007:27), but they do not discuss the affects that such differences in game space would have upon the player's experience of narrative. Spatiality for both Wolf and Boron is quantifiable and can be organised into a taxonomy, their approaches to space see it for its features and components, a decisively utilitarian method of analysis which links again to the notion of the game as a purely about the gameplay that is experienced rather than any narratives that may arise through play. There is little sense of how the space is used by players that either conforms or conflicts with the presentation provided by developers, or how the space can affect the player's experience of the game's narrative.

In contrast to these earlier taxonomies of game space, Michael Nitsche's categories in *Video Game Spaces* (2008) describe the types of spaces with which players interact rather than the ways in which those spaces are presented to players. Nitsche divides the types into 'Tracks and rails', 'labyrinths/mazes', and 'arenas', each covering a different way that players both encounter game narratives and subsequently how narrative elements are deployed and experienced. 'Tracks and rails' are identified by Nitsche as 'the connection of points through movement in virtual space', most easily identified as a singular axis between two points which a player will traverse (2008:173). A player moving through a game space made of tracks and rails will have a similar experience of gameplay and narrative as another player in that the spaces are set out to act as a guide which provides a set structure to navigate. 'Labyrinths/Mazes' build on track and rails as 'the growing complexity of track arrangements leads into […] the labyrinth', this spatial structure is predicated on an abundance of points and axes (2008:176). Labyrinths are spaces where players navigate several spatial possibilities. Rather than just moving from A to B, the player makes decisions about where they will go, this has an effect on the gameplay and narrative that a player will experience compared to a

different player's playthrough. Finally, 'Arenas', 'are mostly open structures with one dominating demarcation line: the surrounding enclosement', these spatial structures provide an open area for activities such as football, wrestling, or combat (2008:183). The arena is a bounded area in which gameplay is contained. Spatial exploration is not a focus as the space can often be fully mapped from a glance, rather the arena is a stage where a player is occupied with the question of how to use the space provided to achieve the goals the game has set out. The games this thesis takes as its case studies are mostly made-up of labyrinths/mazes with momentary arenas which delineate the space for a boss fight. By categorising space through the types of interaction which happen within it, Nitsche highlights a key aspect which I wish to expand on in the framework this chapter puts forward, that space and narrative are continually affecting and being affected by the player.

Games, Nitsche argues, provide the player with identifiable spatial elements to help distinguish the types of space and thus the types of interaction expected of them, or that will be possible, in those spaces. These spatial clues also help players gain an understanding of the world and events and from that, generate a game's narrative. This building of spatial comprehension is described by Nitsche in similar terms to the ideas of Wolf which hold mastery of the game as key to a good performance. In contrast to this emphasis on spatial clues as vital for players' ludic mastery of a game, this thesis argues that spatial comprehension is vital for the generation of narrative, with the act of understanding of game space also resulting in an awareness of how that space co-constructs the narrative being told within the game space. These categories of interactable space provide spatial patterns for player interaction so that spaces can be identified by how players are asked to engage with them. In this way space is a structuring device for narrative, Nitsche argues:

> Through such patterning, space structures the evocative narrative elements and a player's experience of them. This space dependency might be called the space-driven model for content assembly. It provides an abstract model for *space as the structural force of interactive events*. Here, the virtual stage becomes a canvas, and the structures used within it, the tracks, rails, mazes, arenas, or others, are large-scale evocative narrative elements (2008:187 emphasis my own).

Rather than viewing space as an area to master — as a tool to become more efficient at a game – Nitsche describes space as 'a canvas' for the generation of narrative – he argues that without space the game would have no surface to apply mechanics. Space in this sense acts as an organising framework from which narrative can emerge. Nitsche's argument that game spaces provide a structure for the comprehension of narrative is a key aspect in my framework of digital space. This structural aspect provides contrasts with previous accounts of spatiality I have detailed, which produce taxonomies that identify ludic genres but do not incorporate the narratives entangled with the ludic goals.

In addition to providing categorisation of spaces players encounter within games, Nitsche also presents a model of space which incorporates the external reality of the player. His 'five analytical planes' are identified as 'mediated', 'rule-based', 'fictional', 'play', and 'social'; combined these integrate the game and the player within the context of the world outside of the digital space. These are used throughout *Video Game Spaces* to identify the exact spatial plane or combination of planes which is affected by what is being discussed. It is this combining of the intra-story world of the game and the external reality of the player which I will take forward into my new understanding of game space.

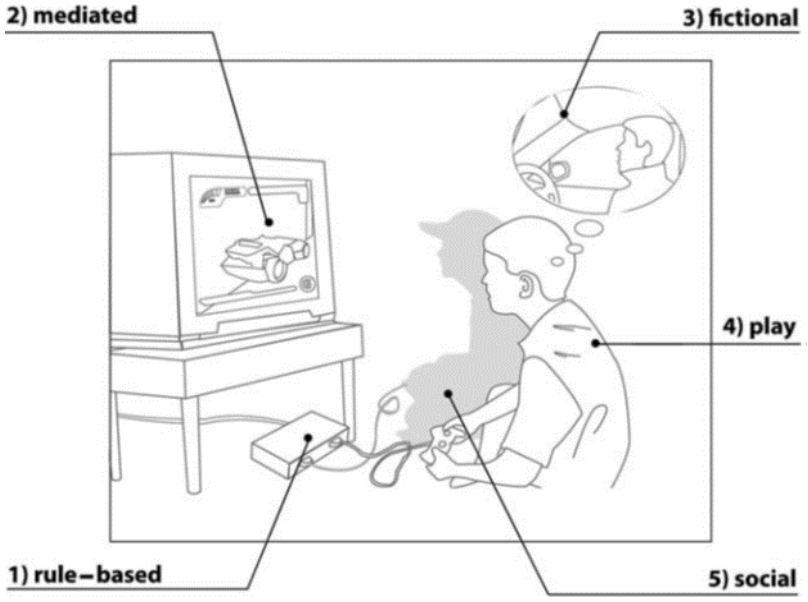

Fig 1: Nitsche's Five Analytical Planes taken from *Video Game Spaces* (2008).

Figure 1 depicts two figures playing a racing game with each aspect labelled as one of Nitsche's analytical planes. It shows the physical distance as well as the imaginative distance between player and game. A player must operate a controller within the play plane to become part of the storyworld in the mediated plane, this can be a keyboard and mouse, a handheld controller, or an experimental/novelty controller, but they are required for the player to participate. While the fictional plane in this example shows an image related to the perspective shown in the mediated plane, the player observes what happens on the screen but may not imagine themselves within the perspective offered by the game. The distance between the planes creates the space where narrative can be generated, a gap allows for interpretation rather than instruction. Nitsche proposes that 'none of these layers alone is enough to support a rich game world', and as such is interested in the connection between the levels rather than the individual planes themselves; a position which draws the planes together but at the same time highlights the differences and the gaps between them (2008:17).

Nitsche's description of the gap between analytical planes shares similarities with Murray's discussion of the maintenance of distance between the real and the fictional in *Hamlet on the Holodeck* (1998). For Murray the space connecting the two planes is more potent that the planes individually, she states that 'in order to sustain such powerful immersive trances, then, we have to do something inherently paradoxical: we have to keep the virtual world "real" by keeping it "not there"' (1998:100). Stories rely on maintaining a delicate balance between immersion and distance. For Murray this is vital as complete presence in a storyworld would mean it would not be recognised as fiction. It is therefore important to note that it is not only the categories which have been chosen which are important but also the connections between them. A game's intra-story world and a player's external reality do not exist as completely separate entities but are held together through such aspects as Murray's immersion, and as I will argue in chapter four through the entanglement of the environment in all matter.

The language of 'planes' and 'gaps' in Nitsche and Murray's work are spatial metaphors necessary to present theories surrounding games in a manner which replicates ways of thinking about physical space. Even when taxonomies of this kind are not related directly to the spatiality of games nor to the experience of space found within games, often theorists

present their categories within a spatial structure. Although these have a different focus, often creating a way of analysing games which looks at how it is produced, they either touch on spatial metaphors in explaining their taxonomy or provide a visual diagram which structures each category within space. These include Lars Konzack who uses the example of *Soul Calibur* (Namco, 1999) to provide 'seven different layers of the computer game: hardware, program code, functionality, game player, meaning, referentiality, and social culture' (2002:90). Using layers as a way of separating each category, Konzack provides a spatial metaphor as a basis for his taxonomy. Layers are imagined physically as either something which requires excavation to reach lower levels, as seen in archaeology, or used as a supporting structure as seen in the baking of cakes. Konzack's layers build on top of each other starting 'at the lowest layer' where 'we find the hardware technology', passing through the functionality layer which 'depends on the code and physical nature of the computer', and finishing with 'the social layer' (2002:91, 98). The spatial metaphor produced by using layers reveals the value which Konzack places on elements of games. It establishes what is the most vital component for the corresponding theory via the lowest level which provides a base – hardware – and provide a final layer which produces value through the game's social culture which is presented as the final product in a game.

A similar space-orientated structure can be seen through the use of diagrams which generate spatial structures out of theories which are not inherently spatial. For example, Ian Bogost and Nick Montfort's *Racing the Beam* (2009) provides five levels: reception/operation, interface, form/function, code, and platform with culture and context acting as an external scaffolding. Montfort and Bogost describe these as levels rather than layers, as such although they still connote a linear progression, they are more detached and individual than Konzack's layers as 'each of which, by itself, connects to contexts of culture' (2009:145). In this way the levels presented in *Racing the Beam* act as individual elements which float within a context. Although this results in a set of levels which do not rely on another to exist, unlike Konzack's layers, it also presents a set of levels which do not interact with each other.

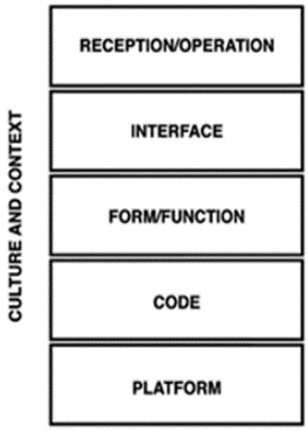

Fig 2: Diagram of levels from Montfort and Bogost's *Racing the Beam* (2009:146).

However, when the diagram is presented in *Racing the Beam* (Figure 2) the lack of connection between each level is made manifest, as each level is presented as being built on top of the previous one, with culture placed off to the side. This suggests a reliance on each level to support the next one. This hierarchical structure organises levels in such a way which prompts a linear reading, moving from platform to reception/operation, one segment at a time, that simplifies the ways in which these aspects may interact with each other. The structure privileges platform and as *Racing the Beam* is a book concerned primarily with platform studies, which is the study of the games systems that games are played on, this reflects their intent. A diagram's spatiality reveals structures of value as well as the relationship between separate entities. These layers and levels echo the taxonomies of Wolf and Boron, as both seek to present a way of categorising a game into component parts for analysis. The diagrams used to visualise these categories, the described structure and its content present game studies as reliant on spatial metaphors in its production.

My diagram of game space, which draws insight from other diagrams, provides a way to account for the interconnected nature of space, both digital and real. All aspects presented in the new diagram influence one another, but no aspect (level, layer, or platform) is given a greater importance by being a base for all the others. In addition, my diagram allows me to consolidate the theories which I am drawing from to formulate the understanding of digital space that informs this thesis. However, it is important to note that, as I have previously stated about taxonomies, they can be of limited use if considered the only production of a theoretical approach. Because space emerges in performance, no structural theory or framework can

capture the ongoing, perpetual nature of its constructure. Therefore, the synthesis of existing categories and taxonomies into this new diagram should not be read as an attempt to definitively theorise game space, but as a starting point for exploring its co-creation by players, games, and environments.

The aspects which contribute to the experience of digital game space, according to my new synthesis, are: Environment, Presence, Contextual Space, Narrative Generation, and Play. The diagram below visualises these aspects as entangled within a player's day-to-day reality.

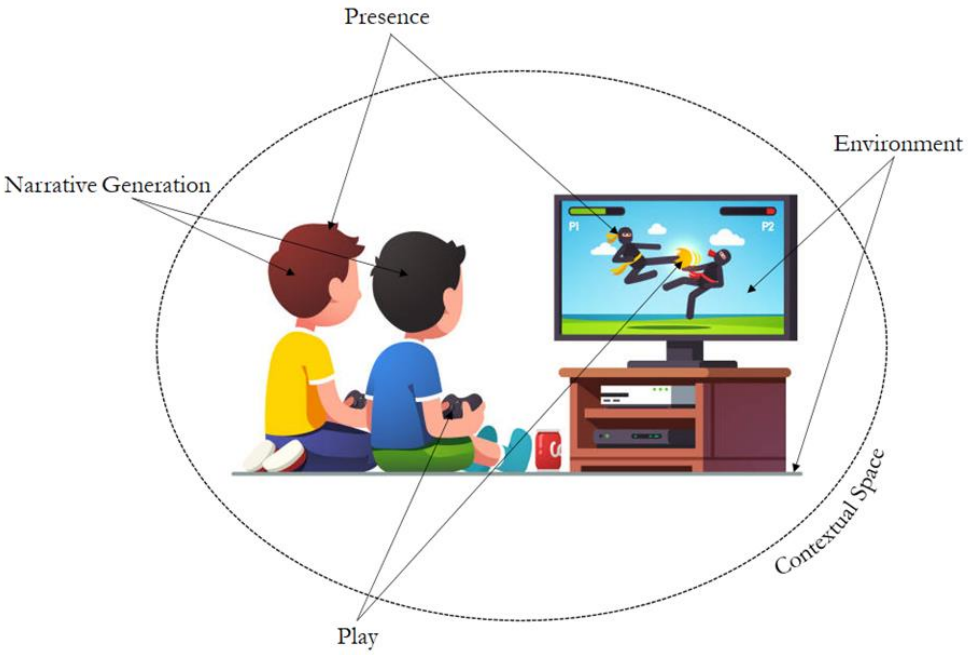

Fig 3: A visualisation of the aspects which make up a player's experience of digital game space.

Environment grounds play within a particular spatiality. This can be the material environment where the player encounters the game, which could be a public space (arcade), private space (the home), or a quasi-public space (a street or park). The environment is also the digital space of the game, the space which the avatar navigates during play. In this definition the boundaries between physical space and digital space are blurred, as the digital is often entwined with how we interact with the physical, (navigation, shopping, socialising, etc.). While the relationship between the intra-story world of games and the external world

can be considered one way, with digital games requiring the external world to exist, the physical infrastructure required to produce the digital and the energy required to run digital, means that the intra-story world of digital games have had an impact on the environment beyond the game. This could be the straightforward fact of an online or 'cloud' game requiring space in server rooms, or the more deleterious effect of game development on GHG emissions and the climate crisis. The digital world is held within the external world, each affecting and being affected by the other. As such, although combining the two into a singular term 'environment' could cause confusion and the conflation of the two spaces, I believe that uniting it via the player provides a perspective on space which allows for a comprehension of games that goes beyond the confines of the digital. To map out how the proceeding chapters expand on these aspects, in chapter three I examine *Bloodborne*'s intra-story world to consider environment as an agentive aspect in the production of space and narrative.

Presence is the space a player occupies while playing. Much like environment, Presence exists within both the intra-story space and the external space; the player exists physically within the external world and uses a controller to pilot their avatar within the game. Although players do not inhabit the digital space physically, the deictic shift which has taken place to provide the player with the coordinates for imaginative travel have positioned the player in a specific location and time within the game. As such the player can be present in both concurrently. A player's presence in both spaces as a narrative agent and an agentive force, alongside the environment as a similarly dual aspect, allows for games to be considered a nested space by this thesis. Rather than a separated entity which exists in a vacuum, game space is entangled with its external space. Its nested nature positions humans and non-humans within the game and their actions as extensions of patterns and diffractions in the external world. In chapter two I look to detail how the avatar the player inhabits and the positioning of their view of space changes player presence, and how the change drives the interactions that happen in that game space.

Contextual Space relates to the sets of entanglements players are a part of in their everyday reality. These entanglements can be made up of, for example, their lived experiences as a person, their knowledge of the mode the game is produced within (i.e. the Gothic, Science Fiction, or Fantasy), and/or their imbrication within wider entanglements such as the fact of

digital game players being consumers whose actions fuel the climate crisis. During play these entanglements aid in the generation of a game's narrative, affecting how the narrative unfolds, or becomes, within the world. In Fig.3 I have set Contextual Space as surrounding the other aspects specifically with a dotted line rather than a solid division between the location of gaming and everything outside. My aim is to present Contextual Space as a continual process of emergence which changes dependent on the player, as well as when and where the game is played. In chapter four I return to Contextual Space in further detail to understand how my own experience playing *Death Stranding* is connected to my experience of living within the climate crisis.

Narrative generation is similar to the fictional plane in Nitsche's diagram (Fig.1). The player combines what they have seen in the environment through their own presence in the game within their own Contextual Space to then generate meaning and from that narrative. This is a constant process that is continually happening both within a digital world but also in the real world, as every space a person encounters is being produced within Contextual Space which produces narratives – either non-fictional or fictional. It is through this generating of narrative that, to borrow from Schechner, the symbolic reality is altered, with both the human player and the non-human aspects of a game shifting through performing the game to have different values so that a story emerges. In chapter two I will examine how narrative generation in *The Binding of Isaac: Afterbirth +* combines the Gothic and PCG to produce a perpetual story world unique to digital games as a storytelling mode.

Finally, *Play* describes the moment-to-moment gameplay, the actions players take within the environment. This can be button presses or moving location in a game which uses augmented reality within material space, or the possible actions which an avatar can be programmed to perform to interact with the digital. In the image the two players are holding controllers, the physical objects which help facilitate play are important in themselves to the experience of game space, as I will discuss in chapter 4. The result of play in turn feeds back into the environment and the player's feeling of presence which can then confirm or disrupt current Contextual Space and the narrative which has been generated. Play is how players co-perform game space, in chapter three I will examine how the non-human engages with play as a process which produces both space and narrative.

By setting out this diagram of aspects of space that visualises a player's experience of games, this chapter has developed a notion of space as built from the interactions between overlapping agencies, inclusive of humans and non-humans. While this thesis draws on the work of de Certeau to theorise space as being continually produced, I move away from the notion of humans as sole performers of space; instead, combining uses of performance theory in game studies as well as the prop theory of Kendall Walton, to recognise the agentive power of the non-human in shaping space and narrative. These interactions continually alter the value and use of a space, shifting intended meaning over time. However, space is not an inert, passive aspect that is manipulated through these interactions, rather, space is integral in its own becoming. As I state in later chapters, the notion of space can be considered agentive enough to be considered a character within a game's story.

Space is a key organising principle from which games structure their narrative and gameplay experience. Narrative is embedded into the game space, coded into unseen triggers that activate story progression, or present in the use of spatial and visual elements or objects, which act as props for the generation of narrative. Narratives are spatial, and space emerges from narratives. As de Certeau argues, the act of immersing oneself in space is to 'compose a manifold story' (1988:93). The following chapters of this thesis are concerned primarily with interrogating the entangled notions of space and narrative, both within the intra-story space of the game and how that extends beyond that nested space to incorporate a player's external reality. As the next chapter will find, algorithmically created game space affects the types of narrative which are generated during play; specifically, I will argue, favouring stories created in the Gothic mode.

Chapter 2: Uncovering Procedurally Generated Spaces in *The Binding of Isaac: Afterbirth +*

In the previous chapter I argued that the production of space in games is reliant on the relationship between player and environment. In particular game space and narrative are reliant on their continued performance which occurs during play. While the previous chapter focused mostly on the human element, with the diagram situating the player's experience of game space, this chapter looks to consider the role of Artificial Intelligence in this process of performing space. In doing so this chapter answers the second objective presented in the thesis: To interrogate how the use of AI to generate game space, Procedural Content Generation (PCG), affects the generations of narrative within those games. In order to achieve this I interrogate how the relationship between player and environment changes when the environment is manipulated by an algorithmic system allows for a further theorisation of the generation of narrative. Reading the popular Rogue-like *The Binding of Isaac: Afterbirth+* (2015) from a perspective informed by the work of Michel de Certeau, I argue that procedural content generation (PCG) fundamentally changes the process of producing space by requiring players to learn an underlying grammar of space, rather than navigating a specific manifestation of that grammar. As a result, I go on to argue that these games often rely on genre conventions drawn from science fiction, horror, and as is the case in *The Binding of Isaac: Afterbirth +*, Biblical Gothic, to provide a rationale for these changing spaces. These conventions are incorporated into the cultural/social schemas the players bring with them into the game and are used to generate narratives within the continually shifting spaces created with the involvement of AI.

Michel de Certeau's chapter 'Walking in the City' in *The Practice of Everyday Life* begins by placing the reader in the perspective of 'seeing Manhattan from the 110th floor of the World Trade Centre' (1988:91). The city is sprawled out below the viewer, in such a way that they may be convinced by the impression that they are, '"seeing the whole"' rather than a limited human-bound perspective (1988: 92). This is a false totality, de Certeau argues, which provides a 'fiction of knowledge', that is both pleasurable and seductive in its power (1988: 92). This

point of view, and the fiction of knowledge it provides, is reflected in the ways in which players interact with top-down spaces in games. Examples of these include well-known titles such as the city management simulator *SimCity* (Maxis, 1989), the action-adventure title *The Legend of Zelda: A Link to the Past* (Nintendo, 1991), and popular shooter *Hotline Miami* (Dennaton Games, 2012). As John Sharp notes, top-down games create a 'separation between the player and their representations in the game' (2014:113). The distance between the player and the avatar-bound perspective created in top-down games echoes the transformation of walker to voyeur de Certeau argues is caused by a shift in perspective. There are complications with mapping the movement from walker to voyeur directly onto the first-person to top-down perspective, as players are still able to perform actions which have an effect on the world, contrary to de Certeau's assertion that a distance to the environment entails a 'lust to be a viewpoint and nothing more' (1988:92). However, the fiction of knowledge is found within both as Sharpe continues that 'this from-above vantage point creates an objective view of the gameworld', marking an assumption within game studies that a top-down perspective provides an objective and omniscient viewpoint for the player (2014:113). Examples of this type of perspective can be found at the level of moment-to-moment gameplay by which I mean the actions and perspective that occur during a play session, seen in titles such as *Hotline Miami* (Dennaton Games, 2012) (fig. 4), or embedded into the user interface through the inclusion of a map or mini-map as seen in games such as *The Elder Scroll V: Skyrim* (Bethesda, 2016) (fig. 5) and *Grand Theft Auto V (GTA:V)* (Rockstar Games, 2014) (fig. 6).

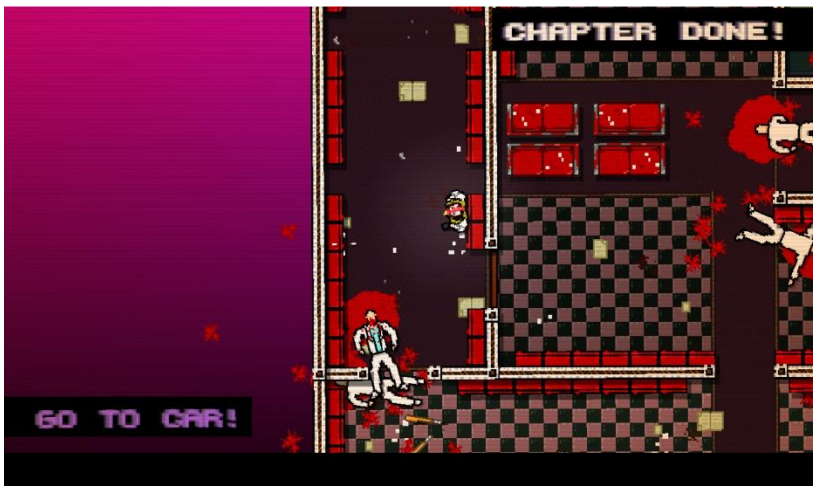

Fig 4: The top-down perspective in *Hotline Miami* (Dennaton Games, 2012: PC)

Fig 5: *Skyrim'*s map identifying points of interest for exploration and fast travel (Bethesda, 2016: PS4)

Fig 6*:* The mini-map (bottom-left) in *GTA:V* showing the position of police (Rockstar Games, 2014: PS4)

The top-down map, or map-like, perspective seen in the above images renders the game world as what de Certeau calls the 'cosmos', a space transformed into a text which contains all knowledge and is fully readable by the player (1988:92). Often these reflect 'perfect' information back to the player, the topography remaining fixed regardless of the time passed between play sessions while the elements viewable from a top-down perspective, for example enemy locations, are updated throughout the time spent in a play session. As such, these map-like perspectives avoid an issue of traditional cartography, namely that, as Denis Wood puts

it, 'every map is out-of-date before it's printed' (2010:94), because they are able to respond to changes in "real time". Traditional maps record a specific instance of space which becomes out of date quickly with any additions to the space (such as new buildings and roads) and are also vulnerable to larger scale changes in the landscape such as coastal erosion and earthquakes. Games are not held within one temporal instance as they use both time and space 'together to anchor textual, visual, auditory, and other interactive cues' (Wei et al., 2010:2). These map-like perspectives anchor the temporal into these perspectives by constantly updating them through the addition of new markers, or the movement of established markers, for example the police in *GTA:V*, to indicate their whereabouts in the game world.

In all three of the examples above, the top-down perspective provides players with knowledge beyond what could be obtained from an embodied first-person perspective. This knowledge, however, is refined to show only what the developers have deemed to be the most important aspects of a game's space. In *GTA V*, for example, the mapped perspective abstracts the topography of the landscape into the elements which complement the game's intended playstyle – location of the police, hideouts, and gun shops. In this way the map, by abstracting what is determined to be of importance to the player, and flattening it into a top-down frame, identifies what constitutes power within the game space: a knowledge of spatial elements and agents. Denis Wood identifies this effect which I apply to games, in his introduction to *Rethinking the Power of Maps* when he states 'Power is a measure of work. Which is what maps *do*: they *work*' (2010:1, emphasis in original). In other words, maps are agents of power, providing a hierarchy of knowledge which is deemed important to be represented and as such present an expected narrative direction. In addition, maps also produce knowledge as well as ordering it. For example, Africa is made much smaller on world maps in relation to Europe which itself is not in the middle of the world, as it is presented in many Western maps. In games this manifests as what a player is expected to interact with within a game being presented through maps and from map-like perspectives, cementing the core gameplay and themes. Often, then, maps are a prescriptive force for play, identifying locations and objects with which players should be interacting. For example, *Skyrim*'s map contains points of interest which highlight area in the game such as cities, towns, and other locations where important quests, people, and items can be found. Even *Breath of the Wild* (Nintendo, 2018) and *Tears of the*

Kingdom (Nintendo, 2023), while not explicitly labelling their maps with signposted locations, use topographical elements on the maps to signal to players where they should be travelling. In games such as *Hollow Knight* (Team Cherry, 2017) which place maps as a core part of its gameplay, being able to map a space is a reward for progressing through the game, as the more you push through uncharted spaces the more the map fills out when you reach a safe point of a bench. In these set spatial layouts maps as such are both rewards for players as well as paths towards rewards such as more powerful equipment and items, a result of which is more power within the game world. As I will come to argue, the inclusion of PCG for generating game space alters how these spaces are mapped and the outcome of the player's mapping of an area.

The power evinced by a top-down perspective is not exclusive to the developers who build the game's environment, but also applies to the game's players. De Certeau examines the map as proof of the desire to observe from this perspective before the infrastructure was in place to inhabit it, he states: 'Medieval or Renaissance painters represented the city as seen in a perspective that no eye had yet enjoyed. This fiction already made the medieval spectator into a celestial eye. *It created gods*' (1988:92, emphasis my own). By presenting a perspective that was unavailable at the time, early cartographers offered a power for the reader, a god-like capability to see the whole city at once. This imbuing of God-like powers theorised by de Certeau in early map making is replicated in games which involve an aspect of the top-down perspective, frequently giving players access to knowledge that they would not naturally acquire from a singular embodied perspective. Importantly this knowledge is not complicated or challenged, it is always accurate as the player may fill in the map as they move, each discovery filling in a blank segment of a map. Power in this case comes from the act of 'discovering' a space even though these points of interest are often already occupied or known spots within the game's story. Spatial discovery equals power. Damien B. Schlarb argues for this correlation in his discussion of *Horizon Zero Dawn* (Guerrilla Games, 2017), stating that 'Traversing the game world furthers Aloy's story, making available more and more areas on the map, as players become more adept at managing the game's various roleplaying submenus as they upgrade and refine Aloy's abilities and equipment' (2022:146–7). The process of filling out the map aligns with an increase in ludic power in game as the player's action of uncovering the

surrounding space results in the player's avatar Aloy levelling up and equipping more powerful armour and weapons which makes further areas of the map accessible. Exploring space and increasing power in games such as *Horizon Zero Dawn* is cyclical. In games such as *GTA:V* the mini-map also reveals the positions of the police during pursuit and combat, as such the player is given such an abundance of knowledge that they are elevated to godhood within the game space, in a similar way to how de Certeau argued the tradition of cartography figuratively created gods from humans.

The top-down perspective in games; however, offers a false totality, the power which both players and developers hold are illusions. The developer can use the perspective to move players towards specific types of gameplay or goals; nevertheless, they cannot guarantee the behaviour of players within a game's space. Meanwhile the perspective players have on the game world is limited to what is visible on screen at the time, with other areas of the game usually unloaded while the player is not in them to cut down on processing. For example, with the help of mods players on Animal Crossing New Horizons have been able to zoom out the camera to see that the player's island is situated on a rolling tube and that only a small square of the island is loaded at any one time (Shesez, 2023a). These hidden aspects are within all games, not just those with a top-down perspective or with map components, as there is always an element of space which the player cannot standardly access without mods. These out of bounds areas reveal spatial details of the world, usually that there is no continuation of the space beyond the level's borders as seen in out of bounds content made regarding games with a level selection format such as *Super Mario 3D World* (Shesez, 2023b), and those with an expansive open world such as *GTA:V* (Shesez, 2018). However, the perspective offered by maps and games such as *Hotline Miami* feed into the illusion of total knowledge being granted to the player through a bird's eye view of their surroundings.

PCG poses a challenge to the false totality offered by top-down perspective in games. Defined by Noor Shaker, Julian Togelius and Mark J. Nelson PCG is 'the algorithmic creation of game content with limited or indirect user input' (2016:1). In other words, PCG is a set of programmes which produce content without the user having to directly guide that process.

Although PCG happens only with 'limited or indirect user input', it should be noted that importantly there is some user input in the generation, whether that is providing an input to begin the process or through the algorithm monitoring and reacting to the actions of the player. As such Shaker et al's definition describes a relationship between user and AI and not a system which is purely an algorithm which presents data. This notion of PCG naming a relationship between human and non-human agents, and not merely a process that takes place independently, complements my previous assertion that the production of space is reliant on a relationship between a game's environment and the player. I will use Shaker et al's definition to examine the relationship between player and AI system not only in the act of the production of space but also in the generation of narrative. I will argue that the generation of space by an AI alters the player's relationship with the game's environment, leading to a fundamentally different generation of narrative compared to a game space which is predefined.

As the use of the word Content in PCG rather than 'space' suggests, Procedural Content Generation is not tied to the generation of space. PCG has been used to generate the weapons in the *Borderlands* series (Gearbox Software, 2009-2019), creatures in *No Man's Sky* (Hello Games, 2016), and Radiant AI generated quests in *Skyrim* (Bethesda, 2011). It is also not tied to games, one of the earliest examples of PCG was one of Alan Turing's final projects, a love-letter generator which was programmed in 1952 by Christopher Strachey for the Manchester Mark 1 computer. Modern-day equivalents to Turing's generator can be found in the proliferation of bots being used as creativity tools. The key aspect linking all of these examples is that they are all procedural, each carried out through the implementation of a set of steps provided by a human developer but activated by a machine. As such PCG fundamentally requires both computers and human input to run, the products of PCG are co-constructed by both the human and the non-human. Having recognised that PCG can be used to create any element of a game or digital art, this chapter is an examination of the generation of space, which itself has spawned an entire game genre: the Rogue-Like. The genre of game is named after *Rogue* (Toy and Wichman, 1980), one of the early adopters of procedurally generated space which became popular. To be a Rogue-like means to share similar properties to the eponymous *Rogue*, this includes but is not limited to; randomly generated spaces, hard difficultly, turn based combat, ASCII art. While procedural content generation continues to be

a required property, what properties need to be shared for a game to be known as a Rogue-like has shifted, for example, ASCII art is no longer vital for the title to be bestowed.

The inclusion of PCG as a core element of most Rogue-likes is that it complicates traditional understandings of game space as made from a set layout. Michael Nitsche, who argues that space is the primary organising principle for narrative in games, considers procedurally generated space in the experimental game *Charbitat* (2007) identifying complications which this type of space produces, asking: 'how can we find our way in infinite space?' and 'how can we structure context between regions in this world?' (Nitsche, 2008:168). Both questions configure space as an entity which requires structure to be navigated and are both answered in *Charbitat* by the inclusion of a system of keys and locks which hold the player within a section of the infinite whole. I agree with Nitsche that structure is lent to these generated spaces through the spatial mechanics with which the player interacts, as they provide a path of progression through a space; however, the shape of that structure varies dependent on the size, scope, and type of generation. PCG is not a singular entity whose effect in one game's space will be replicated in another, but there are similar aspects found in the ways space generation and players interact and as such I will be interrogating the consequence of this type of spatial production on the ways players generate narrative.

The Binding of Isaac: Afterbirth + and the illusion of power

Edmund McMillen and Florian Himsl's *The Binding of Isaac* (2011) is a game that eschews the illusion of total knowledge which other games involving a top-down perspective have embraced, and instead incorporates, to use de Certeau's terms, the experience of the walker. I will argue that breaking the illusion of knowledge comes from the combination of the game's procedurally generated space and its reliance on generic conventions from the Gothic tradition. To provide context, *The Binding of Isaac* is a Rogue-like game which received commercial success as a Let's Play title for YouTubers, McMillen stated that it began selling '100-200 copies, 1,000 copies a day—that summer, the first summer after release, which was probably nine months after release, is when it just exploded, and it just kept climbing higher

and higher and higher' (McGlynn, 2018). The player controls Isaac as he descends into his basement and beyond to escape his mother, who has received word from God that Isaac must be sacrificed in proof of her devotion. To defeat the many enemies that Isaac will face, the player uses Isaac's tears as bullets in the style of a twin-stick shooter; using the right analogue to control the direction of the shots, and the left analogue stick to move. The main gameplay focuses on the player finding their way from the start room to the boss room, defeating enemies and finally the boss so they can access the next stage. Periodically throughout the game the player will gain access to an item which will have an effect on gameplay. For example, such items can make the tears Isaac shoots more powerful, bigger or augment them with an effect, or they could affect the movement speed or maximum health of Isaac, among other possibilities. Having the opportunity to access these items in set rooms and post boss fights makes unveiling the full extent of the stage, otherwise known as a full clear, a risk-reward strategy. Experienced players know how to manage that risk so not to unnecessarily full clear but to receive the maximum number of items. Death in the game is common and expected, dying a certain number of times is required to unlock all the items and avatars. The game's difficulty as such has become a part of its appeal, Jose Otero's review described it as 'a tough game, but one that balances challenge with a refreshing feeling of the unexpected' (2017). As such the game fits within Stephen Curtis' term Deathsetics as 'dying provides a mechanical and aesthetic pleasure for the player' (2015:n.p). The purpose of frequent deaths in *The Binding of Isaac: Afterbirth +* is to set-up a satisfying and acceptable level of difficulty which provides players with a sense of achievement when they succeed.

The viewpoint that the player has of each stage is a top-down perspective which locks to the room the player is currently in whilst in the top righthand corner a map displays the rooms which the player has already cleared (fig. 7).

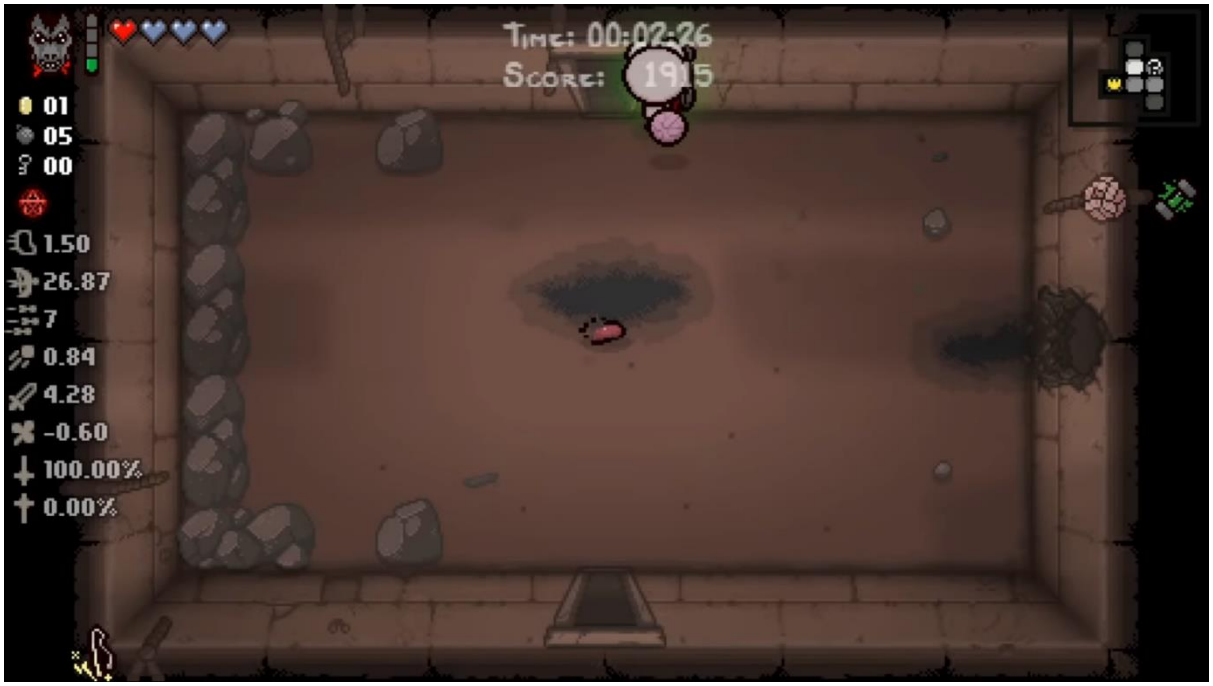

Fig 7: The Perspective of *The Binding of Isaac: Afterbirth +*
(Edmund McMillen & Florian Himsl, 2017: Switch)

From this perspective, the player can see the number of exits and any enemy sprites that they must defeat before moving on. The map shows the player's current room in white, light grey indicates already explored rooms, and dark grey those not visited yet. By moving into a dark grey room, the player unveils it and the shape of the rooms beyond its doors is added to the map. Although the perspective on the room is top-down, the sprites appear from the side-on perspective typical of a 2D side-scroller. Due to this mix of perspectives (top down and side on), the player is unable to see everything as part of the rooms will always be obscured behind Isaac and the enemies. What is obscured could be an item, obstacle, or enemy, and although these would be temporarily hidden, as the sprites will move, this possibility must be taken into consideration during play.

The Binding of Isaac: Afterbirth + uses seed values as a way of generating its dungeons. At the start of the game a player presses 'new game' and a seed is generated (which the player can see in the pause menu). In this case, a seed is a combination of 8 characters which can either be the letters of the alphabet or 0-9, excluding 5, I, O, and U, which results in a possibility

space of 32^8 or 1,099,511,627,776 possible levels. If this seed is notable in any way, or the player wants to revisit it, they can input that seed in the main menu and be taken to that level again. The use of a seed limits the number levels generated – there cannot be infinite combinations; however, the number of possible combinations is far beyond what a single human could experience. In addition, one of the aspects of Shaker et al's definition of PCG is that it is not fully random, as although there are random elements which affect the outcome of an algorithm, PCG cannot be purely randomised content as the playability of levels would be impossible to manage. Therefore, as well as the structure implemented through using a seed value as the initial input, there are conditions embedded in the programming which must be met.

Provided below is a pseudocode version of the algorithm for *The Binding of Isaac: Afterbirth +*. Pseudocode, is defined by Ian Millington as 'an imaginary programming language that cuts out any implementation details particular to any real programming language' (2019:np). In this case the pseudocode below provides plain language descriptions of each step of the algorithm which determines the size of the stages the player will encounter:

```
NumberOfRooms = Min(20, Rand(0, 1) + 5 + Floor(StageId * 10 / 3))
if CurseOfTheLabyrinth then
 NumberOfRooms = Min(45, Floor(NumberOfRooms * 1.8))
elseif CurseOfTheLost then
 NumberOfRooms += 4
end
If StageId == 12 then –The Void
NumberOfRooms = 50 + (Rand() % 10)
end
if IsHardDifficulty then
```

NumberOfRooms += 2 + Rand(0, 1)

end

(*Level Generation*, The Binding of Isaac Rebirth Wiki)

This code ensures that early levels have a maximum of six rooms, with more rooms being potentially added the further the player progresses up to a potential maximum of twenty rooms to navigate. This is the result of the variables included in the pseudocode, Min(20, Rand(0, 1) + 5 + Floor(StageId * 10 / 3)). The calculation takes the smallest number from either 20, or the result of Rand(0, 1) + 5 + Floor(StageId * 10/3). StageId increases the further the player is in the game and as such provides a larger number to be added into the equation. As a result, the number of rooms should increase with each stage the player progresses through. The code includes an extra element which can change the experience of level growth for players, in the pseudo code above there is reference to "CurseOfTheLabyrinth" and "CurseOfTheLost" which both affect the number of rooms avaliable to the player. "CurseOfTheLost", for example, will add 4 to the total number of rooms. These effects will only happen on the stage the curse occurs on and is not guaranteed to happen in every iteration of the game.

Once the layout of a stage is set, each individual room is allocated a type. The majority of rooms will be allocated as "standard rooms", these have no other purpose but to be moved through, often they contain enemies but they can also contain light puzzle elements or just a pickup item such as a bomb, key, or coin. However, each dead end will either be a closet (a small room in keeping with the floor's aesthetics which will have a combination of items or pickups) or it will be one of the unique special rooms which provides different functions for the player to engage with. The infographic below (fig. 8), from *The Binding of Isaac gamepedia* page, details all possible room types:

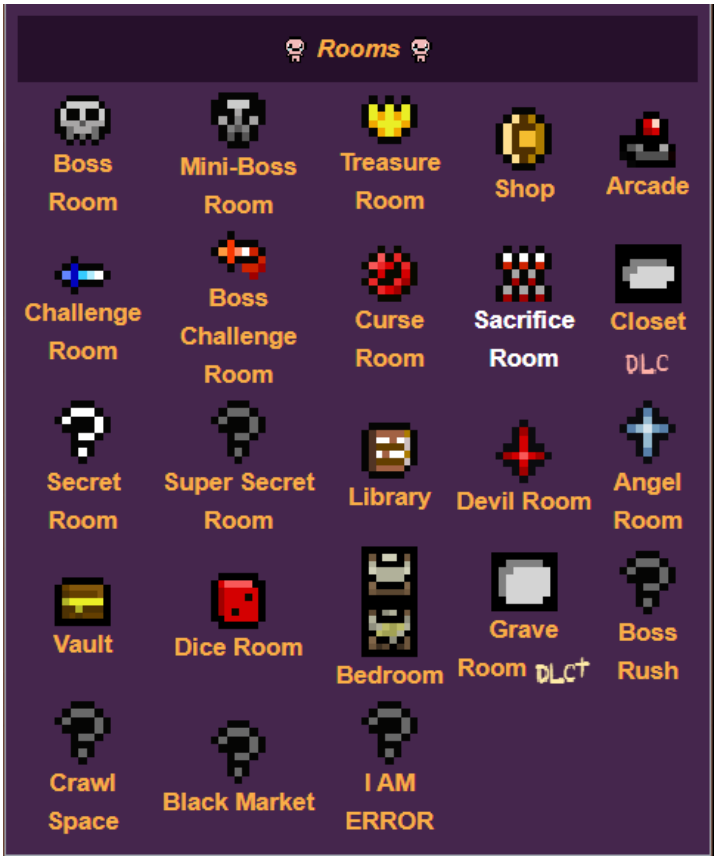

Fig 8: All unique room types available in *The Binding of Isaac: Afterbirth +*. (*The Binding of Isaac Wiki*, 2014)

The rooms which will be generated on every stage are the boss room, “secret room” and “super-secret room”, with the “treasure room” and “shop” guaranteed until the player kills Mom and descends into the womb unless they carry the Bloody Crown or Silver Dollar Trinket which guarantees it appearing. All other rooms are contingent on an element of randomness or the proficiency of the player, for example, devil rooms are less likely to spawn if the player takes damage. Both the criteria for spawning and the placement of these rooms is shown in the pseudocode for the placement of the treasure room.

```
if StageId < 7 or (StageId < 9 and HasTrinket(BloodyCrown)) then
    PlaceRoom(ROOM_TREASURE, DequeueDeadend())
```

(*Level Generation*, *The Binding of Isaac Rebirth* Wiki)

The pseudocode above shows what stages can have a treasure room, the conditions for spawning one outside of the original criteria, and that the placement must be within a dead-end, i.e. a room with only one door.

Regardless of placement within the stage, these rooms will serve the same function to the player on every visit. Functions can be split into three categories:

1. They offer the player an item. Either freely or in exchange for coin or health.
2. They offer the player pickups. Either freely or in exchange for coin or health.
3. They ask the player to risk their health, coin, or items for something which is revealed afterwards.

Players must balance the functions they engage with if they wish to make it to the end of the levels presented. As rooms other than boss rooms are not vital to the completion of the game, the player can choose to interact with any of these functions or with nothing other than the boss. This series of rules, functions, and their implementation in building a level recalls the way in which de Certeau writes about pedestrian speech acts. He states that 'the act of walking is to the urban system what the speech act is to language or to the statements uttered' (1988:97). In other words, the act of walking is a system put into action, with rules and functions which dictate its length, direction, and orientation. In the same way, the level maps of *The Binding of Isaac: Afterbirth +* are instantiations of a systemic set of rules and functions, put into practice through the players' presence in the game world, and, in this sense, akin to pedestrian speech acts. Pedestrian speech acts, de Certeau states, are made up of three elements:

1. 'A process of *appropriation* of the topographical system on the part of the pedestrian', the taking on of a spatial system similar to how speakers take on a system of language (97, emphasis in original).

2. ‘It is a spatial acting-out of the place’, moving around space engages an instance of that topographical system and thus produces space. Much like how speaking a sentence out loud produces an instance of language by engaging with or ‘acting-out’ that system of language (97).
3. ‘It implies *relations* among different positions, that is, among pragmatic “contacts” in the form of movements’ (98, emphasis in original). A walker’s existence in a space produces relation between themselves, the space itself, and anyone else within that space. A person may walk past a tree, for example, which puts them both in relation with each other, much like how a sentence in its construction puts nouns in relation to each other through verbs.

A person who walks within the city is actioning a pedestrian speech act, the walker uses the system of the streets (appropriation) to chart their own individual course (spatial acting out), which consequentially connects them to the environment and other people (relations). When applied to games which use PCG such as *The Binding of Isaac: Afterbirth +*, the space which is being navigated is constantly reinvented, unlike the city. It is important to note that city space is not static, at the moment-to-moment scale, traffic, roadworks, and other people can change the topographical system daily as well as larger changes over an extended period of time; however, the city space is not reinvented each morning. Walkers do not have to remap routes as they have found their destination is now to the south rather than the north. As such a one-to-one mapping of pedestrian speech acts from the city to the game is not possible, but there are aspects that become apparent within the differences which establish how a game’s use of PCG affects a player’s experience of a game’s space. To better understand this, I will examine how the three elements of de Certeau’s pedestrian speech acts are presented in a potential player’s spatial exploration of *The Binding of Isaac: Afterbirth +*.

To begin, the first element is identified as ‘a process of appropriation of the topographical system’ (97). The walker absorbs and appropriates the system of the space around them by, for example, using paths made for pedestrian movement. In the same way speaking requires the system of language to be known to the speaker to be used. In both cases it is the grammar of that system which the user is appropriating. David Crystal in *A Dictionary*

of Linguistics and Phonetics defines grammar as that which 'refers to a level of structural organization […] the study of the way words, and their component parts, combine to form sentences' (2008:218). Grammar is both an understanding of the relations between individual aspects within the whole, and the rules for using these aspects to be successful in being understood. This is seen in language, in the spatial system of a city, and, within digital games. Grammar is a part of the programming language used in *The Binding of Isaac: Afterbirth +*, which structures the rules and relations of the game space that is then appropriated by the player. This is visible during play in two forms. The first is found in what can be seen; the player observes and recognises the shape of an individual room and its features.

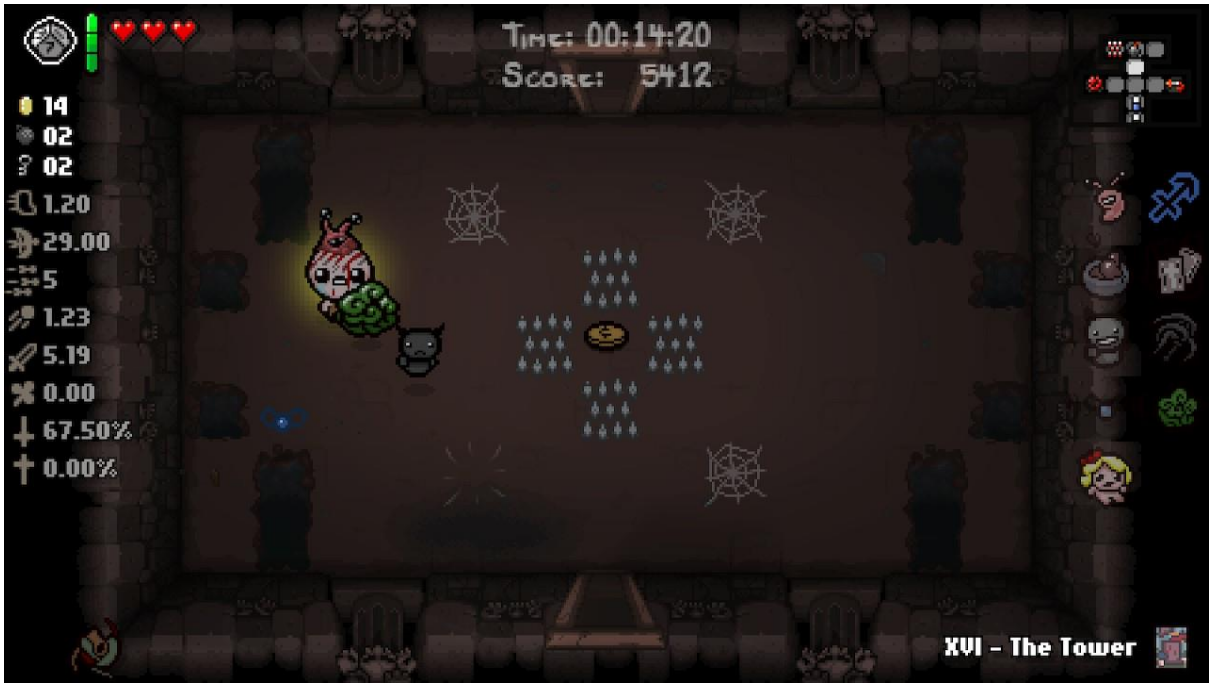

Fig 9: A room in *The Binding of Isaac: Afterbirth +*.
(Edmund McMillen & Florian Himsl, 2017: Switch)

In fig.9, we see a room which has doors to the north and south, and a number of spike traps. The player knows that there will be another room to the north and the south, and also that moving Isaac onto a spike trap will result in losing health. This appropriation of systems also happens on a secondary level, that of the unseen, where the player can guess the layout of the floor without visual clues such as doorways.

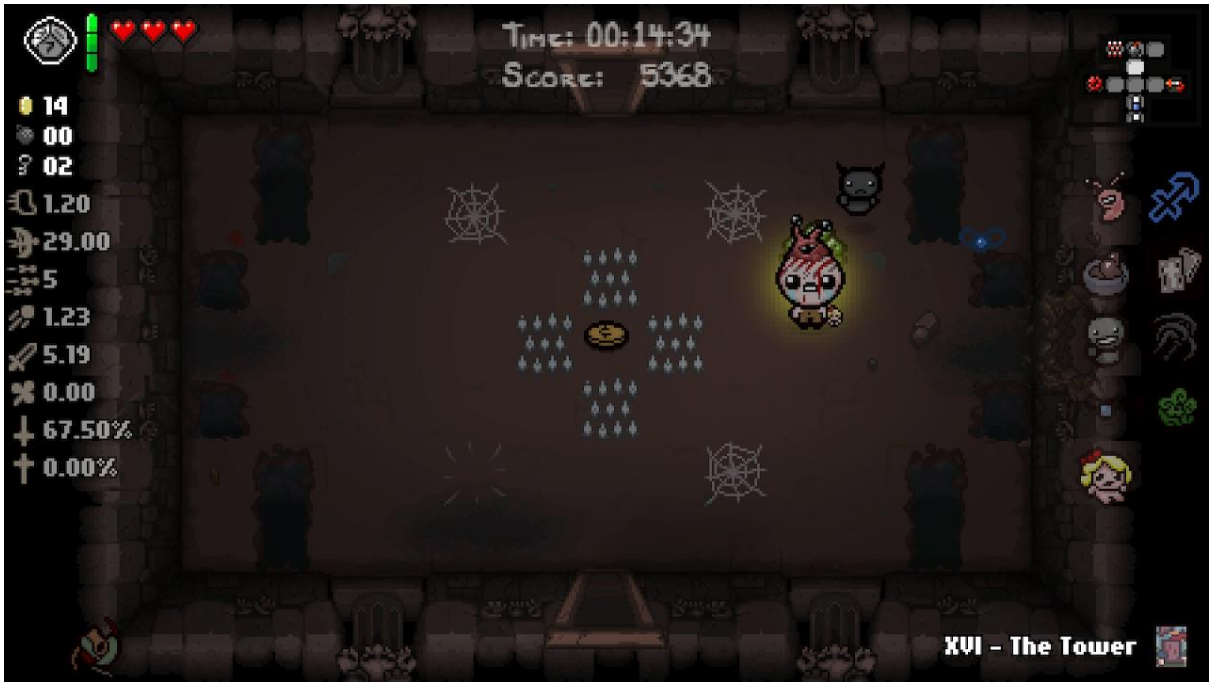

Fig 10: A room in *The Binding of Isaac: Afterbirth +*.
(Source: Edmund McMillen & Florian Himsl, 2017: Switch)

Fig.10 is located in the same room as fig.9 and provides an example from my own gameplay to show how awareness of the game's systems helped me deduce that there was a hidden bombable wall to the east. These bombable walls can be found by accident or through a learned engagement with the rules and relations which builds the game space. The lines of code which control the placement of hidden rooms have not been exposed but can be learned through practice without direct teaching. Through navigating the space, the player learns the spatial grammar of the stage without knowing the specifics of the seed, nor the algorithms that determine the content in that seed. Through extended play, the rules found within the code which govern the placement of rooms, can be parsed by the player without the direct reading or understanding of the code. The experience of gaining an understanding of the game's rules and functions is explained by YouTuber Sinvicta, who uploads a playthrough of a seed every day, when he states that 'You will get to the point where you can [find secret rooms] without actually seeing the rest of the map'; however, as he continues 'that is not always the case' and the player's spatial grammar can fail (Sinvicta, 2020). Learning a spatial grammar is not the same as having exact knowledge of the layout of the current floor, this is because, as Sinvicta indicates, the grammar identifies possible locations for the secret rooms, but if there are

multiple possible locations available only one will be correct. In the case of fig.10 and fig.11, I had two bombs in the first image and zero in the second, between the two screenshots I tried both the west and east walls as I was certain that one of them would be correct. However, my first attempt, on the west wall was a failure, not because I hadn't learnt the game's rules and relations correctly, but because there are multiple possible options but only one will be correct. Therefore, even if a player is fluent in the system uncovering every possible room may require multiple attempts on any given floor.

Learning the spatial grammar of *The Binding of Isaac: Afterbirth +* requires the player to be practicing that knowledge via moving through the game's levels. This aligns with the second aspect that de Certeau identifies as part of pedestrian speech acts that 'it is a spatial acting-out of the place' (98). The movement of the individual acts-out the topographical system of space, in a similar way that speech acts-out language. In *The Binding of Isaac: Afterbirth +* this action manifests as the player using the controller to navigate Isaac through the stage. The systems are acted out by being used, as such the player must, for example, walk through doors to make it to the next room and bomb the correct wall to access the secret room. It is by playing and acting out the game's space that these rules become apparent on the screen. This is similar to what de Certeau states about the individual pedestrian speech act – that: 'in a way, he makes them exist as well as emerge' (98). Pedestrians actualise an instance of the system, presenting a version of movement through the city which can be formed. In the same way players actualise the spatial system of *The Binding of Isaac: Afterbirth +* that would cease to exist at a visual level without the player's interaction and acting out of the system.

The individual actualisation of the system is only ever temporary; however, as the player enters a cycle of unveiling the map steadily before it is lost again. The full layout is hidden when a playthrough of *The Binding of Isaac: Afterbirth +* begins, unless a seed is inputted which a player has watched someone else play, and even then certain aspects will change dependent on their skill level. In this sense, the knowledge which would have been avaliable to the player immediately in a different game, either through the game itself or through online guides detailing specifics of level maps to help players progress, unfolds as their time within the

specific iteration of the game increases. As such, the player becomes a cartographer of the space around them, mapping the level only to leave the map at the exit and begin anew with the next one. Following de Certeau, then, the player's exploration is what causes the game's spatial system to emerge, with this emergence, in turn, adding to the player's overall knowledge about that particular stage. This amounts to the co-construction of game space, a process that confers transitory and contingent knowledge upon the player. Knowledge, or understanding, always increases as mapping takes place but once that has finished, the knowledge becomes redundant, it becomes useless as a new completely unmapped area must be traversed and the cycle of gathering spatial knowledge begins anew.

A perpetual cycle of increasing spatial knowledge followed by a sudden removal of that knowledge runs counter to storytelling methods which starts the reader/audience/player in a position of ignorance, before providing a steady increase in knowledge of the space and plot until the story's conclusion. This method can be found within the Gothic mode, which often begin with a space whose full layout both the audience and the protagonist is ignorant of, for example, the houses found within *Dracula* (Stoker, 1897), and *Crimson Peak* (Del Toro, 2015). Glennis Byron and David Punter in *The Gothic* discuss the haunted castle, suggesting that 'the castle has to do with the map, and with the failure of the map', with protagonists in these spaces being disorientated and locked out of certain rooms until critical moments in the plot (2008:262). In other Gothic texts such as *House of Leaves* (Danielewski, 2000) and *White is for Witching* (Oyeyemi, 2009), it is the house itself which is a character which limits the spatial knowledge of protagonist and reader, by either growing and shrinking its rooms, allowing or denying entry to certain spaces or by alluding in the narrative to spaces which cannot be reached, such as the crevices between walls. The eventual unveiling of hidden areas, often basements or attics, is directly tied to a story twist or revelation, the audience as such then moves to a position of knowledge about both the space and the plot. By subverting this method through introducing a cycle of gain and loss, *The Binding of Isaac: Afterbirth +* opposes the structure of continual progression towards a mastery of space through experience. The nature of PCG entails the loss of spatial knowledge gained in the actualisation of the system in exchange for spatial progression to the next floor. To move forward in the game, means

rendering the previous floor's map useless, the player has moved on to a new floor and thus needs to make a new map.

Players, however, must actualise the system set out through the programming, for example, they cannot walk Isaac through solid walls and doors which are closed. In this way, the individual speech act in a game is more constrictive than the pedestrian speech acts of de Certeau, which can be modified by the pedestrian to 'increases the number of possibilities […] and prohibitions' (98). As although a pedestrian is constricted in a similar way, unable to walk through solid walls, they are able to create shortcuts and interact with the spatial system of the city beyond the interactions afforded to a player. An example of a radically different use of the city for pedestrian street acts is parkour which Julie Angel's chapter on parkour in *Choreographic Dwellings: Practising Place* defines as 'an imaginative reworking of the existing spatial configurations' (2014:178). Changing the function of a wall from a dividing feature to a path is completely possible within a city, while the same act is impossible within the game space of *The Binding of Isaac: Afterbirth +*. There are, however, ways in which the seemingly rigid system which underlies and creates the game world can be subverted, through the use of "out of bounds" movement. Out of bounds being where the player moves in a space they are not supposed to be able to access.

There are not many opportunities for out of bounds movement in *The Binding of Isaac: Afterbirth +*, the way the game space is built leaves little room for the player to fall outside of the map either purposefully or accidentally. However, in previous versions of *The Binding of Isaac* if the player finds a crawl space (fig.11), they are able to use two bombs to push Isaac through the floor and out of bounds.

Fig 11: An example of a crawl space.

(2017: Switch)

From here the player can walk underneath the room and enter the 'black market', a rare area with multiple items which the player can purchase with heart containers. This way of going out of bounds is not accessible in *Afterbirth +* as the method has been blocked by the developers. However, its existence in other versions of the game shows that there are ways that players can add possibilities to the space beyond those envisioned by the developer. As such, even though *The Binding of Isaac: Afterbirth +* can seem bounded in its construction, with there being nothing outside of the visuals shown on screen, these examples of a type of non-space between designed spaces provide evidence that games are not simply made up of a visual space, but also a hidden space which may or may not be accessible.

The third and final of de Certeau's notes on pedestrian speech acts, is that they imply '*relations* among different positions, that is, among pragmatic "contacts" in the form of movements' (98 emphasis in original). By this de Certeau is arguing that through movement the walker establishes themselves as distinct from their surroundings but also inextricably linked to them. This is another aspect of the grammar of a system which not only encompasses

the rules that determine the way language and space are built, but also the way each individual component of the sentence or street relates to the user. Megan Morris identifies the act of walking as one of creating links between the self and everything else both spatially and temporally, as 'like speaking, walking is a referential activity: with every step, the walker creates a near and a far, a *here* and a *there*, a *now* and a *then*' (Morris, 1998:64 emphasis in original). Pedestrian speech acts cannot be purely spatial, they incorporate temporality in the time it takes to complete an act, and the temporal setting the walker finds themselves in. I argue that through movement the player establishes relations not only between themselves and the game, but also between the individual elements of the game's space. These relations build as the player spends more time within the game, both on the level of the individual run but also through every instance of play.

To return to the crawl space, it is unique within the systems of the game as it is devoid of relations to the other rooms the player encounters. It does not appear on the map, even once discovered, and, upon moving into the crawl space, Isaac appears on this new screen. However, despite the room's disconnection from the rest of the level, the player is encouraged to see the crawl space as a linked but categorically different space in comparison to the other rooms. This is achieved through the player's movements smoothly joining the surrounding space together. To access the crawl space the avatar must enter a trapdoor, similar to the trapdoor found within a boss room which takes the player to the next stage. This downward movement is reflected in a change of perspective, from top-down to side-on; a perspective which is only ever seen in the crawl space and the non-playable cutscenes between stages. The side-on perspective is therefore reserved for inter-stage movement. As such during these movements Isaac is set in relation to the stage they have just left and the stage they are about to begin exploring. This perspective between stages also puts in relation each stage to each other, a side on view uncovers the space as a layered descent rather than a flat world that can be traversed much like the level select of games such as *Super Mario World* (Nintendo, 1991). The creation of relations also occurs within the stages themselves, where through movement the player creates relations between their avatar and the individual elements which make up the stage, including obstacles, enemies, walls and doors. As it is only through movement that space is actualised, it is also through movement that these relationships are established.

Turning to the Gothic

The relations that are built between player and the world through the speech acts of movement are also related to the ways in which the thematic content of the game is contained within the game's space. A pedestrian speech act within games is not only tied to the structural aspects of a game's space, but also the narrative which the players are building from a different system of rules and expectations; that of genre, specifically that of the Gothic. A turn to the Gothic is vital at this stage as the majority of Rogue-like games such as *The Binding of Isaac: Afterbirth +* which employs PCG are built within the Gothic mode. Whether that is the dungeons of the original *Rogue* (Toy and Wichman, 1980), the undead planet of *Returnal* (Housemarque, 2021), or eternal escape from Hell proposed by *Hades* (Supergiant Games, 2020). The ways in which PCG in particular affects game narrative appears to be particularly suited to the Gothic, a suitability which I argue is due to the verb of uncovering which the game asks players to continually undergo. Although I wish to discuss genre as it is more typically used in literature and film, as a way to categorise 'the types of worlds reproduced within games in terms such as location and atmospheric or stylistic convention' (King and Krzywinska, 2002:27), the term genre is most commonly used in discussions of games to describe gameplay. Therefore to avoid confusion I will be using Geoff King and Tankya Krzywinska's alternative – 'milieu', which Krzywinska establishes as encompassing 'character design, narrative, atmosphere, and iconography' (Krzywinska, 2015:61). *The Binding of Isaac: Afterbirth +* is one of a number of games which use the Gothic as a theme in this way; other examples include *Planescape Torment* (Black Isle Studios and Interplay Entertainment, 1999), *Bloodborne* (FromSoftware, 2015), and *Dear Esther* (The Chinese Room, 2012). Gothic has been identified as a key modality for contemporary digital games; Dawn Stobbart states that 'the video game industry has embraced the Gothic' with the mileu being found in the structure, protagonists, and the setting of a vast number of games including the titles named above (2019:451). This infiltration of the Gothic, Ewan Kirkland argues, is not new, he argues that there has been a 'haunting of the medium, conscious or otherwise, since its early years' (2022:2). Games and the Gothic have been documented as well suited to each other. To aid the categorisation of Gothic Games Krzywinska points to a set of five coordinates which games use to establish themselves as Gothic. These are the false hero (*The Binding of Isaac* is used by Krzywinska as an example), mise-en-scène, the representation of affective emotional states, style, and

function. It is these which players read and appropriate during play to establish relations between their avatar and the game space beyond simply their spatial locations. These coordinates are integral in the creation of the game mechanics or 'verbs' that the player will be using throughout. In *The Binding of Isaac: Afterbirth +* the main verb is 'shooting'; however, I will be focusing on the game's use of the verb 'uncovering' which is shared by Gothic protagonists as a key element in exploring spaces within the game and the gothic texts more generally. Beyond games, the Gothic mode is often characterised spatially, whether this be by critics who place the literary mode in relation to its architectural heritage (Townshend, 2019), or otherwise describe the narrative structure of the gothic mode in spatial terms, such as Chris Baldick whose definition hinges upon the enclosure in space as a key component (2009). Beyond these definitions and contextualisation, Gothic literature and culture is most often understood through its labyrinthine spaces and settings in which characters often find themselves trapped or lost, from castles, abbeys and haunted houses of classic gothic literature to the isolated and paradoxically claustrophobic outdoor spaces of related modern genres such as folk horror (Scovell, 2017), the Southern American Gothic (Castillo and Crow, 2016) and the ecoGothic (Parker, 2020).

The Binding of Isaac: Afterbirth + makes use of the Gothic as a spatial mode by drawing on the tropes and trappings of the Biblical Gothic, meaning a Gothic mode informed by theological texts. Literary examples of this include texts which have been anachronistically included within the mode of the Gothic such as *The Divine Comedy* (1472) and *Paradise Lost* (1667), as well as classic Gothic texts that deploy thelogical themes which include *The Monk* (1796) and *Melmoth the Wanderer* (1820). The roots of this style of Gothic come, Diane Long Hoeveler suggests, from 'the growing confusion that existed between the realms of reason and faith' and that this 'uneasy coexistence of the immanent and the transcendent can be seen throughout the gothic corpus' (2010:5–6). *The Binding of Isaac: Afterbirth +* taps into this reservoir of biblical imagery, presenting to the player bosses which are either directly named after their biblical counterpart such as Satan, or those who are indirectly named such as 'The Duke of Flies', a reference to the Lord of the Flies, Beelzebub. Items which reference the biblical include holy texts, 'The Bible', 'Book of Revelations', demonic entities 'Abaddon', and 'Lord of the Pit', Angelic entities/items 'Guardian Angel', and 'Holy Mantle', religious relics corporeal or

not, such as ‘Judas’ Shadow’, and ‘Lazarus’ Rags’, and references to the crucifixion, ‘Stigmata’, and ‘Blood of the Martyr’. Combined with the locations ‘Sheol’ and ‘Cathedral’, *The Binding of Isaac: Afterbirth +*’s mise-en-scène establishes Gothic spatial coordinates through the lens of the biblical. This is an intentional decision by the developer Edmund McMillen who, discussing the role religion played in the creation of the game, points to a personal history with Christianity, he says that ‘[his] dad’s side of the family, they’re all born-again Christians,’ who told him that ‘everybody's going to Hell’ while ‘[his] grandma was Catholic’ (Grayson, 2012:np). McMillen continues on the topic of the Book of Revelations, a text he remembers being obsessed with, stating:

> Giant beasts rising out of the ocean? It was just, oh my God... I almost wished that was real so I could see it happen, because I would love to see giant angels come from the heavens and take the believers away as a f***in’ beast rises out of the ocean and opens up Hell. It would be worth dying for, because it would be the most epic thing you will ever see (Grayson, 2012:np).

McMillen draws on the Gothic mode in his description of religion as horrifying, in the way it affects the individual and its potential for apocalyptic destruction. This results in violence being a core element of that Biblical Gothic which McMillen explores in *The Binding of Isaac*, as he states; ‘I grew up with a picture of a bloody dying man who is suffering for everybody, a martyr, and it’s the whole idea of self-sacrifice’ (Grayson, 2012:np).

This plot is based on the religious story called either ‘The Binding of Isaac’ in Jewish traditions, ‘Aqedah’ in Hebrew, or ‘The Sacrifice of Abraham’ in Christian versions. I will be using the Hebrew Aqedah here, in order to more easily differentiate between the religious story and its retelling in McMillen and Himsl’s game. The Aqedah is focused on sacrifice and is viewed in Christianity as a precursor to the crucifixion. This Old Testament story is found in the book of Genesis chapter 22, where God commands Abraham to offer his son as sacrifice. After Isaac is tied to the altar and Abraham is ready to proceed, a messenger of God appears to stop the ceremony, saying ‘Lay not thine hand upon the lad, neither do thou any thing unto him: for

now I know that thou fearest God, seeing thou hast not withheld thy son, thine only *son* from me' (Genesis 22:12). A ram then appears as an alternative sacrifice and Abraham is blessed with the angel promising to 'multiply thy seed as the stars of heaven' (Genesis 22:17). Allusions to the Aqedah begin immediately beyond merely the title as the prologue, the cutscene which plays before the player presses start, includes the words: 'To prove your love and devotion, I require a sacrifice. Your son Isaac will be this sacrifice. Go into his room and end his life as an offering to me, to prove that you love me above all else!' This recalls the command God gives to Abraham: 'Take now they son, thine only son Isaac, whom thou lovest, and get thee into the land of Moriah; and offer him there for a burnt offering...' (Genesis 22:2). Both quotations are presented as the word of God and include the name of the person to be sacrificed and the location of where that sacrifice should take place. Although the game begins with the command of God being delivered in a similar way to its biblical counterpart, once the player begins to control Isaac, it is clear that the focus of *The Binding of Isaac: Afterbirth+* is not the figure of the sacrificer but Isaac himself. Rebekah Welton identifies that 'the point of view of the story has shifted from that of the narrator in the text to Isaac in the game, or a "defocalisation", in that Abraham is no longer the narrative's focus' (2020:296). As a result of these changes, which also encompass what Welton calls, 'translocation' as it moves from biblical Israel to contemporary America and 'transvaluation' as the retelling changes the connotations of the biblical story from positive to negative, Welton finds that the developers 'have presented the Aqedah from the point of view of a child in order to emphasise – and exploit – the horrifying trauma likely experienced by the biblical Isaac' (313). The change of focus shifts the tone to that of horror and fear, something which the player is motivated to escape.

This is not the first time that a retelling or interpretation of the Aqedah puts Isaac as the focus of the narrative, other texts, for example Yvonne Sherwood's letter 'Isaac to Abraham' (2014) and Maria Varsam's article 'If Isaac Could Speak…: Redefining Sacrifice' (2005). The Jewish title, which is the one the game chooses to use, focuses on Isaac in comparison to Aqedah which translates to 'the binding', and the Sacrifice of Abraham which places Abraham as the focus. However, by using the medium of games, *The Binding of Isaac: Afterbirth +* creates the opportunity to 'give [Isaac] the capability to finally fight' (Welton,

2020:297), Isaac now has the agency to act within the game through the player's control. As a result, the retelling takes a different narrative turn, as the focus becomes the actions which Isaac takes to escape and the continual movement further down.

The moment-to-moment gameplay involves the player navigating a level, collecting items and fighting enemies until the boss room is located. Once the boss has been defeated, the player can descend to the next floor, at which point the process of exploration begins once again. Frank G. Bosman and Archibald L. H. M. van Wieringen categorise the general movement in the game of Isaac downwards as evoking 'the idea of descent in general, and in particular the psychological notion of descending into one's own soul in search for deeper personal understanding, in combination with the Christian notion of hell and the underworld […] as a place where the wicked are punished' (2018:116). It should be noted that while most of the movement is downwards, one stage (Cathedral) is accessed by standing in a beam of light and ascending upwards. In addition, *The Binding of Isaac: Repentance* (Nicalis, 2021) reverses the order of the rooms once Isaac gets to the very end of the descent and asks the player to move back up through the levels. I enacted a cut off at *Afterbirth +* to provide a focus for the chapter; however, its addition of an ascent follows the path of the protagonist in The Divine Comedy, still situating the movement as a biblical Gothic trope. The general movement of the player corresponds to this idea of digging deeper towards something. Each floor introduces enemies with higher health and more complicated attack patterns or extra mechanics. As such, the difficulty increases the further through the game or Isaac's soul the player has descended, or the closer they are to hell and the underworld.

The movement between floors in the game involves a cutscene showing Isaac curled up in a foetal position while monsters surround him on all sides. There is an incongruity between the movement that has been suggested to be taking place (that of moving down into the next floor), and the lack of movement that happens within the transitional cutscenes. This difference has been used in fan theories to speculate on the balance between what is conjured by Isaac's imagination and what exists in his reality. These fan theories are sometimes addressed by Edmund McMillen, who takes an active role within the community. Going as far

as to grant certain theories the status of "canonical". One particular fan theory circulated through an article on Twinfinite by Chris Jecks argues that 'the real point is that [Isaac's] perception of reality is becoming distorted and we are playing through it as he retreats' into his mind in order to escape the horrors of the abuse perpetuated by his month (2012: n.p). On this fan theory McMillen posted that the fan theory was; 'By far the most mind blowingly accurate break down of the overarching meaning behind *The Binding of Isaac*'s ending' (McMillen, 2013). Interpretations of these cutscenes by players, such as Chris Jecks' 2012 analysis of the game, argues that Isaac in the foetal position is the reality of the situation while the gameplay takes the player through Isaac's mental processing of his mother's attempt to kill him. However, whether or not the actions of *The Binding of Isaac: Afterbirth +* are happening in Isaac's reality or are purely a figment of his imagination, the movement downwards still represents the 'descending into one's own soul', which Bosman and Wieringen discuss (2018:116). Regardless of the intent, the player is still guiding Isaac in that direction, engaging in the uncovering of the layout of previously hidden space through appropriating the game's spatial grammar, acting it out through play, and subsequently forming relations between the Isaac that begins the run, and the Isaac that has descended into the soul and defeats either The Lamb or the boss titled '???'.

As the player uncovers the layout of each floor, they move through a series of 'chapters': 'sets of floors which contain similar enemies, themes, bosses, and difficulties. Earlier chapters are divided into two floors, while later chapters contain one floor. Each chapter has different environments…' (*Chapters*, n.d.). These chapters act as a marker of Isaac's current location within the whole and provide a way of measuring progress for the player. With each new chapter the player can expect new challenges and an increase in difficulty. By calling these differing areas the player visits chapters, *The Binding of Isaac: Afterbirth +* connects back to de Certeau view of space as a text, with game space here being structured through the convention of a novel. The floors which comprise each chapter are as follows:

	Floors included:
Chapter 1	The Basement/The Cellar/Burning Basement
Chapter 2	The Caves/The Catacombs/Flooded Caves
Chapter 3	The Depths/Necropolis/Dank Depths
Chapter 4	The Womb/Utero/Scarred Womb
Chapter 4.5 (optional)	???
Chapter 5	Cathedral/Sheol
Chapter 6	The Chest/Dark Room
Endgame (optional)	The Void

Each floor describes cramped spaces of little natural light, excluding the Cathedral which is notable as it is the only floor which requires upward movement. However, the floors differ on the way their setting locates the human and the unseen. Chapter 1, for example, contains the subterranean parts of a building, basements and cellars, which Gaston Bachelard defines using a Gothic lexis, as being 'the dark entity of the house', continuing that 'when we dream there, we are in harmony with the irrationality of the depths' (1994:18). Basements are simultaneously within the territory of the human, contained within the house, whilst also actively distancing the human because, as Bachelard states we will 'find uses for it' but those uses are not immediately obvious unlike other rooms such as kitchens, bathrooms, and bedrooms (1994:18). What the human can do in that space is not immediately defined, and those who inhabit these spaces often face what Stephen Graham describes as 'discourses about cellar-dwellers and other inhabitants of the physically low or subterranean spaces of cities [which] have worked to stigmatise or dehumanise them' (2016:266). The basement and the cellar become spaces where the human can be othered which we begin to see in the game as Isaac's character model from the basement onwards is continually othered visually by items found within each floor. Finally, the basement is often used within Gothic texts as the location for an uncovering of the truth at the climax of the narrative. In these texts the basement is the culmination of the protagonist's quest to discover the truth, and often the epicentre of horror, while in *The Binding of Isaac: Afterbirth +*, the basement is the introduction, the player begins their journey in what is usually the location of discovery and told to venture further down. The

downward momentum the game establishes by exploring deeper subterranean spaces, places the player firmly away from an ascending viewpoint above and towards instead a claustrophobic position where they are unable to see the whole only what has been mapped. Rather than interacting at a distance with the space created by a PCG system, the player must move directly through it, hoping to be going in the right direction, otherwise backtracking until they can drill further into the game's depths.

Both Chapters two and three of the game are made up of floors which have counterparts within physical reality but go beyond the territory of the home. The movement of the player from "The Cellar" to "The Caves" feels like a logical step as 'Cellars have also long been likened to caves' (Graham 2016:266). In addition, the dark spaces of caves can also intersect with basements, for example, The City of Caves network in Nottingham is a system of man-made caves which been used as cellars for pubs, and even as air raid shelters during World War II. The lines between what is domestic underground space, and what lies beyond become blurred, leading to underground systems feeling like a natural evolution for the player's and Isaac's journey. Caves are often imagined as having housed primitive humans, along with being central locations for early worship in, for example, Mithraic Cults. Today they are considered to be a leisure location for pursuits such as spelunking. These entry points for human exploration underground are not only Gothic but grotesque, a term which is inextricably linked to caves. The grotesque originating from the word grotto, which Justin Edwards and Rune Graulund argue, 'derives from the Italian *pittura grottesca* meaning a work (or painting) found in a grotto and refers to the rooms in ancient buildings in Rome which were excavated to reveal murals in a grotesque style' (2013:5).The paintings contained strange half-human, half-animal creatures, impossible structures, and horrendous masks, all elements which can be found in the visual design of *The Binding Of Isaac* the game itself has also been labeled as grotesque, through reviews which use it as a descriptor. Examples include: 'The Binding of Isaac: Rebirth': More Grotesque, More Fun' (Kersting, 2014), 'The Binding of Isaac gets a grotesque retail edition' (Brown, 2012), and 'The Binding of Isaac – A Tale of Grotesque Freudian Horror' (Renholm, 2012).

Cave systems themselves have also formed a foundation for gaming culture: *Colossal Cave Adventure* (Crowther, 1976), a well-documented inspiration for games from *Zork* (Infocom, 1977) to *Kentucky Route Zero* (Cardboard Computer, 2013-2020), was structured around the Mammoth Cave system in Kentucky. These specific cave systems are discussed by Roger W. Brucker and Richard A. Watson in their book *The Longest Cave*. They state:

> Within seconds you lose sight of your starting point. The sinuous passages twist and turn. Always you are confined by walls, floor, and ceiling. [...] The route is never in view except as you can imagine it in your mind. [...] The only sign that you have reached the end is that you cannot go on. And there is no view (1987:XIVV).

Brucker and Watson highlight how caves are hidden spatial structures whose claustrophobic quality is a key aspect considered in their navigation. Between the start and end points of the journey, the spelunker is in complete darkness with little knowledge of their current orientation and location beyond their mental mapping. These underground spaces do not have many of the markers of orientation of above ground spaces such as light, and as such are hard to navigate and map conventionally. The grotesque as a spatial term echoes this notion of disorientation, Edwards and Graulund continue in their understanding of the grotto as being 'like the labyrinth or the crypt, a disorienting and threatening place that inflames anxiety and fear' (2013:5). Caves and the other spaces invoked in chapters two and three are both claustrophobic as well as hidden from view. The layout of each version of these floors are uncovered gradually and mapped by moving through the space. Although orientation within the layout is relatively easy with the inclusion of the map, the process of mapping through movement is found both within the game and in the caves these floors use as inspiration.

From the grotesque caves and the depths of chapters two and three, the player moves into a space which is not directly conceived of as being underground: "The Womb". Mary Russo highlights a cultural/aesthetic tradition which links the cave to the female body in the introduction to *The Female Grotesque* when she states, 'as bodily metaphor, the grotesque

cave tends to look like […] the cavernous anatomical female body' (1995:1). In *The Binding of Isaac: Afterbirth +*, is a parody of the female grotesque; the player has moved through chapters of cavernous spaces into a chapter which takes a womb as its setting. The cavern becomes the womb, they are both 'low, hidden, earthly, dark, material, immanent, [and] visceral' (1995:1) which are all descriptors Russo uses to describe the cave and how it has been linked to the body. Many of these descriptors could be used for the floors which have already been reached and those which lie below "The Womb". In the reading of *The Binding of Isaac: Afterbirth +* that follows, I will be focusing on the 'hidden,' as all floors which the player and Isaac visit must be subsequently explored and uncovered.

Entering chapter four, the player arrives in the fleshy interior, the womb, through a trapdoor which has been visually changed to now resemble a biological opening. It should be stated that *The Binding of Isaac: Afterbirth +* often deploys female body horror to the point of parody; beyond locating its action within a womb for two floors the game includes items such as 'Mom's Bra' and 'Mom's Pad' to trigger the fear effect in surrounding enemies. These are activated items which when used, dramatically pause the game as the visual depiction of the item fills the screen and each enemy turns purple and attempts to move away from Isaac as fast as possible. While this aspect of the game is beyond the central interest of this thesis, the addition of the female grotesque affects the way the spatial elements of *The Binding of Isaac: Afterbirth +* represent the Gothic Mode. Therefore, a discussion of the implications of the feminine on Gothic space is useful for the understanding of how these hidden spaces interact with the generation of narrative by players.

After entering the Womb, *The Binding of Isaac: Afterbirth +* requires players to navigate Isaac through this internal bodily space to The Boss Room to first defeat Mom's Heart and then It Lives (a transformed version of Mom's Heart that resembles a foetus). New enemies are encountered here, for example, Lump, and Dople are both enemies which are informed by the setting. Either presenting an abnormal mass of flesh to fight or a skinless version of Isaac which lives forever within The Womb. The womb-like imagery of these collection of floors, found within both the mise-en-scène and the enemies is an aspect which can also be located in Gothic

texts. In her discussion of the relationships between mothers and daughters in the Gothic, Claire Kahane draws attention to the 'maternal blackness to which every Gothic heroine is fatefully drawn' (1985:340). Often this maternal blackness is uncovered by the heroine in a distinct location, either a bedroom or a secret room. These spaces are also linked to death rather than birth, as such becoming an inverted womb, rather than bringing forth life they are surrounded by ghosts or the ghostly memories of a death. *Jane Eyre* has the red room which is the location of her Uncle's death, while *The Mysteries of Udolpho* contains a hidden room with a skeleton which the reader and the protagonist Emily are led to believe are the bones of her aunt. Womb-like spaces in Gothic texts imbue the surrounding area with the combination of the uncovering of a mystery, and the trespassing into a hidden and forbidden location. In *The Binding of Isaac: Afterbirth +*, The Womb acts as a temporary final chapter, defeating Mom's Heart activates a cut scene and resets progress back to the basement level, once the player defeats Mom's Heart eleven times, choosing to repeat the cycle, the boss is replaced with "It Lives!", a harder to beat version of Mom's Heart, which on defeat then subsequently unlocks chapter five. The player has trespassed into this forbidden space and uncovered the horrors contained within. Although, this is a temporary final chapter, it does mark the end of guaranteed movement downwards, it is from here that the player can choose to move either down or up.

The Womb gives way to the religious spaces of chapter five; this is unsurprising as paintings depicting hellish imagery have, according to Margaret R. Miles, utilised female genitalia as inspiration. When discussing the entering of hell, Miles states that, 'the vagina appears covertly in icons and paintings as the mouth of hell' (1989:156). As such, The Womb acts as an entrance to the hellish space of Sheol, taken from the Hebrew bible and described as 'the land of gloom and deep darkness' (Job 10:21). However, The Womb also opens into the holy space of The Cathedral, with the player able for the first time to make a choice between which of the two locations they will enter. This has an effect on the visuals of space the player will have to navigate, either the darkness of Sheol or the comparatively blinding light of The Cathedral, the enemies they will encounter (demons or angels), and any endgame cutscenes the player receives from that point onwards. However, both are still the same regarding the rules which dictate the creation of the floor's layout, and how that layout is acted out through

the movement of the player. It is the differences in both the direction of travel and the visuals of the space in this chapter which create two divergent possible narratives for the player to generate through play. Either the player enters the underworld, similar to mythological heroes such as Enkidu, Orpheus, and Pwyll, in Mesopotamian, Greek, and Welsh mythology respectively, or the player ascends into a heaven-like space. There are two fundamentally different narratives resulting from this choice to ascend or descend; however, the act of uncovering and discovery are still the same regardless of the route the player chooses.

By choosing to go down to Sheol or up to the Cathedral the player has managed to navigate Isaac to the underworld/afterlife which Bosman and Wieringen argued were the end points to the downward directional journey. Although this is true in the sense that this is the last point for the player to move down through a trapdoor, this is not the end of the journey. There is more to uncover. The last spaces which the player travels into are purely spaces of the imagination, they often have no logical sense or real-world counterpart to compare the depictions. In chapter six, both possible floors, The Chest and Dark Room, are physical impossibilities as they are contained within a golden chest and offer a larger layout than any previous floors. The player enters into a golden chest from The Cathedral or Sheol, which acted as another temporary final floor, but on defeating the boss of that floor five times they find a continuation in a much larger space than the chest could possibly contain, leading to The Chest from The Cathedral or Dark Room from Sheol. The golden chest hides another floor which is entered by moving inside it. What is in it depends on whether the player ascended or descended in the previous chapter. The space inside the golden chest is not only hidden but it is mutable dependent on the choice acted out through movement.

While the interior of the golden chest changes dependent on the route taken, The Void, the only floor of the chapter Endgame, is an amalgamation of all the different floors the player has visited on their way down. It is called The Void because it has no spatial identity of its own, with each room able to be from any floor, and as such spatial cohesion is lost. The player moves from acting out the spatial grammar of each floor knowing how each room will look aesthetically given the floor they are on, to being unable to predict the setting of the next room

before entry. Although this does not change the underlying grammar as the rules which govern how the algorithm sets out the space remain the same, it has the result of removing a sense of spatial coherence which the player has been building between the multiple playthroughs required to reach The Void for the first time. Instead of each floor remaining distinct in its setting and thus building both a cohesive journey and a way of measuring player progress, the final floor compresses every floor into one.

To access The Void, the player has to fulfil the condition of getting to Mom's Heart or It Lives within 30 minutes, at which point the floor ??? (Chapter 4.5) opens as an option, the player descends into a floor with a total of five rooms, the entrance, two item rooms, a shop, and the boss arena. On defeating the boss, Hush, the player is guaranteed a portal to The Void, otherwise, if the player cannot beat the timer, there is a chance that a portal will spawn after a boss which will transport them to the Endgame chapter. The way of accessing the optional sections of the game is therefore not linked to the spatial progress and how much of the layout the player uncovers but to a temporal one, how fast can the player make it from Chapter one to the end of Chapter four. While 'Void' might suggest something 'empty' and 'vacant' (*OED*), The Void still contains enemies and pickups like bombs and keys. The Void is still inhabited but doesn't have a visually distinct identity ('Void,' 2011). Rather The Void represents an absence of meaning, as time and space are compressed, trivialising the player's difficult journey through each chapter by using the visuals of each floor to simulate an instantaneous shift back and forth. The order the player will see each type of setting is mixed up, but The Void is still navigable and is created using the same basic rule set. It therefore highlights the structuralist design of every floor as it draws attention to the setting as unrelated to the space's creation through PCG.

The Void highlights the connecting thread between each floor by placing each theme next to one another. All locations presented are, excluding the catherdral, dark spaces, either literally or metaphorically which are uninviting for humans to explore. The Basement is a 'dark entity', while in The Caves 'the route is never in view', The Womb is both the 'maternal darkness' and a space which cannot be entered, while visiting Sheol, a land of 'deep darkness',

is the purview of mythlogical figures, The Chest and Dark Place are impossible spaces hidden within a box, while The Void is empty space. This element of hiddeness is reflected within the gameplay of Isaac, the player is presented with an empty map and their main activity, beyond survival, is to uncover the space. Players rely on learning the game's spatial grammar instead of a memorised spatial map to navigate these thematically dark and labyrinthine spaces. This action is similar to the verbs the Gothic provides to both its protagonists and its readers. A physical and emotional uncovering often takes place at the same time. As I have mentioned previously, the traditional journey of gaining knowledge in a Gothic text often culminates in the uncovering of a secret passageway, or room. This can become a linear process, the reader and the protagonist are often aligned by how much is hidden to them within the text and the fiction's world, with the journey to the end of the novel being one that builds towards that climactic moment of a reveal.

The Binding of Isaac: Afterbirth + turns that linear process into a cycle, the player completes a playthrough of the game by having uncovered all the space needed to make it to the end of the game (or dies with the reveal denied to them) only to be brought back to the initial floor to engage once again in that act. The procedural generation of these spaces allows for players to do this indefinitely; there is always a new floor to explore and chart, more hidden secret rooms to uncover. Although this could appear to be a process of mastery, a clear movement from ignorance to knowledge, this is never guarenteed in a single run through due to the games difficulty, any particular run could end prematurely. The allure of spatial totality employed by other digital games which utilise either the top-down perspective or the inclusion of maps, is denied to players here. This is denied to the player via the resetting of progress upon death, and the constant changing of the spatial layout between each reset. Although the rules that govern spatial creation can be intuited with enough experience there is no guarentee that the layout will be guessed correctly, or that rooms like the Secret Room can be accessed at all if no bombs have dropped. A total understanding of the floor's layout can only be achieved through the manual uncovering of the space, a process which often leaves rooms still hidden due to a lack of skill, or a lack of a pickup such as bombs, keys, or hearts.

Players continually engage in the process of uncovering as a part of play, and although this is a violent uncovering, one which becomes a byproduct of the game's use of violent verbs such as shoot and bomb, it is an affective theme which is shared by Gothic texts. In this way PCG becomes a tool for expressing a narrative within the Gothic; an algorithmic method of producing a perpetual form of Gothic space for players to continually re-enter and try to survive. Both the player and the protagonist of a Gothic text must reveal secrets and horrors that are contained within a space which must be uncovered. Without an uncovering there is no progress narratively, spatially, and within the game, ludically. The use of an algorithm as such to exacerbate and stretch the verb 'uncover' to envelop many hours of gameplay keeps players in a state of tension while playing the game. Even on a successful completion the player returns to the first floor of the descent, to begin again without a map but with the knowledge of the game's spatial grammar. Although they are paired with a new Isaac, one which hasn't had the toils of the journey etched into his character model, the player has knowledge of the places they have been. PCG in *The Binding of Isaac: Afterbirth +* can only create space from a series of rules and as such although the player's previous maps may be useless in this new version, their knowledge of the system that creates it, the algorithms which produce the space they continually uncover, becomes key in both the navigating of this new version and the generation of narrative within a Gothic mode.

This chapter has examined how the creation of space through procedural content generation (PCG) can be used as a tool to realise the spatial and narrative structure of certain modes of storytelling in games - specifically the Gothic. In doing so this chapter has addressed one of the thesis' research questions, specifically, how does the non-human matter of AI affect the narratives of digital games. In this case study AI removes a player's ability to memorise a space, the illusory mastery of space offered by other presentations of game space through a set layout and a perspective which creates a false totality is replaced by a grammar which can be learned but never "mastered" as the meaning and possiblities found in a game space cannot be exhausted. After a new configuration of rooms was created through the combined efforts of the player and the algorithm, the gameplay keeps both human and non-human together as co-constructors of narrative and space through the process of uncovering. Player's continually act out the spatial grammar of the game as well as act out the narrative mode of the Gothic

through a perpetual uncovering of space and narrative. The use of AI removes a sense of a true ending to the story, with each successfully ending or premature death the player is sent back to the beginning to start the process of spatial as well as narrative uncovering. The key aspect that will be taken forward from this chapter is that the player is always in the process of developing knowledge of a game's space and narrative through their interactions with the non-human. As I will come to discuss in chapter four, this knowledge becomes a type of entanglement which is a part of a player's Contextual Space developed during play sessions.

Chapter 3: Non-Human Agency in *Bloodborne*

In this chapter I move from a discussion of the game spaces (and the non-human agencies at work in their creation) to an examination of the non-human characters which populate those game spaces. In the previous chapter I have established that PCG can be used to alter space through the code it is created from; altering the building blocks a game's space to create a game world whose layout can be committed to memory. This chapter continues to look at how AI can alter space and narrative but focuses instead on way which move beyond the spatial and narrative manipulation possible from its programming. In this way this chapter responds to the third objective stated in the introduction: To expand the term non-player character (NPC) to include agentive non-human matter. I will examine the implications of recognising non-human matter in digital games as a co-constructor of space and narrative through an analysis of the agency of non-player characters (NPCs). I have chosen to examine NPCs as they act as a game's characters – a vital element of most constructions of narrative. To answer the question of how AI affects digital game narrative it is useful to explore points of comparison between narratives of novels and films and those found in games. As such this chapter sets out to interrogate NPCs as "characters" who co-create narrative, eventually moving to expand how these terms, NPC and character, are applied in digital games to encompass non-human matter such as space. To consider the non-human matter of digital games as agentive characters, I use Karen Barad's theory of agential realism to produce a new definition of agency in digital games which recognises agency as able to congeal all matter. This Baradian conception of agency supplements previous ideas of agency in game studies, particularly accounts of player agency, allowing for a baseline against which player agency can be measured against. In addition, agential realism provides a supplement to the previous understanding of space presented in chapter one that details space as an entanglement of human and non-human matter which, alongside the new conception of agency, allows space a much more active role. I use my reading of agential realism, alongside posthuman theories of character and the genre conventions of the Weird to provide a definition of NPC which takes into consideration their agentive power. Through this reading, I will argue that NPCs are entangled in games alongside other non-human processes and the player, emerging from the intra-action of play and affecting the relations between the other entities with which it is entangled. Finally, using *Bloodborne* as a case study, I will examine the ways in which this new understanding of NPCs

affects the production of narrative and space.

While the previous chapters in this thesis centered on the player's experience and interactions with space, this chapter turns attention to Barad's work on agential realism in order to better understand the non-human processes which make up games. Barad sets out the theory of agential realism in *Meeting the Universe Halfway* (2007), drawing on the theories and experiments of quantum mechanics to propose a fundamental ontic shift in the understanding of matter and, by extension, the ways in which humans are embedded in materiality. In the framework of agential realism matter moves from being dead or inert, as René Descartes stated, 'merely a mode of an extended thing' (1846[1984]:210), to being agentive, an active participant in its own materialisation. In recognising matter's importance, agential realism shifts focus away from a specifically human-centered mode of thought encapsulated by Cartesian notions of the human-subject separateness which presents humans as a unique category of entity able to observe the world from an external, bounded, vantage point, and therefore positing a posthumanist theory that re-evaluates the human's position as central. Barad defines posthumanism as what 'marks the practice of accounting for the boundary-making practices by which the "human" and its others are differentially delineated and defined' (2007:136). Posthumanism, as Barad deploys it, does not remove the human but looks to challenge the boundaries that have traditionally separated humans from other entities, allowing non-human objects and processes to emerge as important entities in naturalcultural practices. Barad continues that posthumanism is 'not calibrated to the human; on the contrary, it is about taking issue with human exceptionalism while being accountable for the role we play in the differential constitution and differential positioning of the human among other creatures (both living and non-living)' (2007:136). As such, posthumanism, as Barad defines it, sets out to acknowledge human entities and their role, without awarding an unnecessary special status. It is through the recognition of the human as part of an entanglement of agencies both human and non-human that makes Barad's posthumanism well suited to my analysis of games which seeks to understand players as entangled with, as well as deriving their "agency" through relations with, the non-human in digital games.

There is a synergy between quantum mechanics and posthumanism which is not unexpected. As Hajer Al-Hamed states: 'both quantum and posthumanist theories embrace

notions of entanglement, inseparability, relationality, context-dependence, emergence and a reworking of classical objectivity and agency' (2017:49). Both fields challenge classical assumptions about how the world is interpreted and understood. Quantum mechanics disrupts the notions of classical physics which relies on Cartesian ideas about the divide between object and subject, observer and observed, human and non-human. Classical physics is based on there being a reliable divide between these things which is considered innate and definitive. Agential realism uses the philosophy-physics of Niels Bohr as a basis to challenge these ideas not only at the epistemological level, but also at a further ontological and ethical level. According to Barad, Bohr's philosophy-physics challenged two ingrained notions of Newtonian physics. First, for Barad, the notion that 'the world is composed of individual objects with individually determinate boundaries and properties' (2007:107). Instead of these separately bounded objects, Bohr (in line with those working in quantum mechanics more generally) states that the world is made up of relata, the relations between things. In his book *Reality is Not What it Seems: The Journey to Quantum Gravity* Carlo Rovelli provides a simplified understanding of the field and identifies the three main discoveries of quantum mechanics as granularity, indeterminacy, and relationality (2017). While Barad discusses all three, it is relationality which is imperative for agential realism. Rovelli points to relationality as the finding that '[i]n the world described by quantum mechanics there is no reality except in the relations between physical systems. It isn't things that enter into relations but, rather, relations that ground the notion of "thing"' (2017:105). It is through these relations that boundaries are formed allowing human and non-human entities to emerge. As such, preexisting individuals cannot exist in quantum mechanics, whether that be on a small scale (atoms) or a larger scale (planets); they exist because of their relations to everything else.

The second Newtonian notion which Barad states Bohr challenges is the idea 'that measurements involve continuous determinable interactions such that the values of the properties obtained can be properly assigned to the premeasurement properties of objects as separate from the agencies of observation' (2007:107). Challenging the idea held by classical physics that when a scientist uses an apparatus to measure a value from an object the apparatus does not interact with the object in a way which would alter the value, Bohr 'argues that it is impossible to determine the effect of a measurement interaction and have it serve the purpose it was designed for (presumably to measure some particular quantity), and hence

the assumption of measurement transparency is false' (Barad, 2007: 109). In other words, how much of an effect one thing has on another is impossible to quantify, therefore it is impossible to counterbalance for that quantity and present a value which is free from its entanglements with the "agencies of observation". This is presented by Bohr as an epistemological issue in the design of scientific experiments; for example, Bohr asks, how can values taken from an experiment be considered objective, by which he is asking questions surrounding the validity of the knowledge garnered through experiments. How can we be sure that the data extracted from an experiment is true and not affected by bias? Barad states that Bohr's challenge is not only epistemological in nature but also ontological, arguing that Bohr's findings have repercussions for how entities are be perceived - there are no 'determinate objects, with determinate properties and corresponding determinate concepts with determinate meanings independent of the necessary conditions needed to resolve the inherent indeterminacies' (2007:127). All matter is entangled, and everything is inseparable with/in everything else. Later in this chapter, when discussing how interaction has been understood in game studies, I will return to this Newtonian notion to understand how interactions are often thought to be a series of discrete and measurable processes between player and game. I aim to disrupt this notion of player/game separability through Barad's concept of the intra-action (their neologism to replace interaction which establishes relational actions as preceding the demarcation of entities) to state that the typically understood notions of player and game emerge from their interactions at the point of play.

The relationality at the basis of both agential realism and quantum mechanics necessitates a shift in the ways in which space is understood. Notions of space drawn from classical physics position it as a type of container, something in which things are arranged in and in which events occur. According to Newton, absolute space was an unchanging fact which could be relied on when postulating physics. 'Absolute space', Newton claims, 'of its own nature, without reference to anything external, always remains homogenous and immovable' (1687[1999]:408). Absolute space becomes a stage on which all the universe takes place; a never changing, determinable, and reliable thing by which all things can be measured. In the introduction to *The Concepts of Space and Time* Milič Čapek argues that Newton saw absolute space as 'the absolute frame of reference by which absolute motions can be differentiated from the relative ones' (2014:xvii), ranking it above absolute time in importance for

understanding the world. According to such a view, space becomes the measure of all things due to it being all encompassing and ever-present.

The Newtonian viewpoint of space, however, has been subject to challenge previous to agential realism. Michel de Certeau, whose work informed the previous chapters, challenges the notion of space as a container, stating that 'space occurs as the effect produced by the operations that orient it, situate it, temporalize it' (1988:117). In other words, space is produced when there is a body around which space can be organised towards/for. The accounts of space put forward in the work of de Certeau and Barad share similarities in that they all argue for a relational aspect in the production of space. However, de Certeau's theories of space are human-centric and constructivist as they require human action to exist, figuring human involvement in these environments as the spark for the production of space to happen rather than a co-constitutive process. Bringing Barad's work into my understanding of space discloses that the non-human is always already producing spacetime.

This move towards a theoretical framework underpinned by quantum physics highlights a shift in space's epistemological and ontological structure. No longer is space a constant construct which can be relied on in measurements; instead, space, time and matter are entangled as an inseparable web of relations which are constantly reconfigured. Barad highlights this shift in the understanding of space by combining space, time, and matter into the noun, spacetimematter and the verb, spacetimemattering (2007:388). Drawing the three terms into one Barad re-envisions the three separate elements as one element. As a result of producing this fused term, space, time, and matter are not thought of as pre-existing concepts; instead, they are produced together in an entangled mass which cannot be separated. Barad's decision to present the term as a verb, spacetimemattering, also highlights it as a process always in motion rather than a thing which is unchanging. As Barad states '[m]atter isn't situated in the world; matter is worlding in its materiality' (2007: 180-181). It is an embodied and enacted process which is continually occurring to produce itself.

Spacetimematter is renegotiated through what Barad calls, intra-actions, which they use in place of 'interaction.' Intra-action is a neologism which '*signifies the mutual constitution of entangled agencies*' (2007:33, emphasis in original). The term, according to Barad, draws

attention to the inseparability of all spacetimematter, positioning the interplay between entities as preceding and producing the entities themselves. A useful discussion of the difference between the two terms is provided by Nina Lykke who determines that '*Inter*-action is something that goes on between bounded entities, clashing against each other like billiard balls, without initiating mutual transformations' whilst '*intra*-action refers to an interplay between non-bounded phenomena, which interpenetrate and mutually transform each other' (2010:51, emphasis in original). Intra-actions are what makes up 'non-bounded phenomena', the relations which produce things rather than a relay system acting between pre-existing entities. Phenomena is the smallest unit of analysis for agential realism, and is, Barad explains, 'a specific intra-action of an "object"; and the "measuring agencies"; the object and the measuring agencies emerge from, rather than precede, the intra-action that produces them' (2007:128). Intra-actions form phenomena from which entities emerge, are temporarily demarcated, before those boundaries are renegotiated ad infinitum.

That there is an ontological difference between the terms interaction and intra-action is important to understand as interaction is a term commonly used in game development and game studies. The term is most often used to refer to the actions which a player (usually conceived as an individual entity) takes during play. For digital games, interactivity is often touted as a defining feature with many definitions of games focusing on their interactivity. Rafaello Bergonse places interaction at the very beginning, stating that 'a videogame is a mode of interaction between a player, a machine, and possibly also other players' (2017:253), similarly Eric Zimmerman defines games by highlighting their interactive nature - 'A game is a voluntary interactive activity' (2006:160), whilst Chris Crawford argues that interaction is 'a crucial factor in their appeal' (1982:n.p). As interactivity is so central to games an agential realist approach requires a reevaluation of how our understanding of digital games changes. Applying Barad's work on intra-action to games has significant implications that bear on the very nature of games. Moving from interaction to intra-action requires a shift in thinking of games as closed ontological systems with which players engage from an external perspective, to thinking of games as entanglements of player and game. From which players emerge as part of that entanglement.

Interaction identifies the player as a bounded entity, who arrives at the game as an

individual cut off and entirely separate to the game. The player then interacts with the game through its input device (controller/touch-screen) much like, to continue Lykke's analogy, a player of billiards hitting the balls with a cue to generate a new game state. Various definitions betray the bounded nature of interaction as it has been deployed in game studies. Crawford defines interaction as: 'a cyclic process between two or more active agents in which each agent alternately listens, thinks, and speaks—a conversation of sorts' (2013:28). For Crawford, interaction in games is a process of receiving data, analysing it, and responding which is then reflected back in kind. By positing interaction as a conversation which has clear divided roles for speaker and listener and a clear order for interaction (listen, think, speak) Crawford's definition treats player and game as bounded entities which meet, interact, but do not mutually transform each other in that act.

The usefulness of the term interaction has already been challenged within game studies. Its relevance and use have been debated by scholars such as Toby Smethurst and Stef Craps who argue that 'the ontological usefulness of the term ''interactive'' has waned' (2015:3). Terms such as reactivity and interreactivity have been put forward as possible replacements. Dominic Arsenault and Bernard Perron define games as a 'a chain of reactions' in 2008, describing an example set of reactions: as 'if the player stumbles upon a blocked door, he can react by looking around, with the game reacting to the manipulation of the joystick by panning the virtual camera around' (2009:120). Key for Arsenault and Perron is the time which divides up a player reacting to what the game presents, the game absorbing and then reacting to the information given by the player. In this way games become a call and response, each action bounded up in an instance of time and reacted to with another bounded action. The term, 'interreactivity' is used by Smethurst and Craps 'in order to acknowledge the fact that during gameplay, it is not only the game that reacts to the player but also the player who reacts to the game' (2015: 5). Interactivity for them is a one-sided affair which emphasises the game as a machine that reacts to player input while, at the same time, places the player in a unique position of only taking actions and never reacting. Interreactivity treads part of the same path of intra-actions by drawing player and game into a mutual relationship of reacting to each other's actions, but the boundaries between player and game remain unchanged.

Both reactivity and interreactivity replicate interactivity's reliance on individual bounded

entities and their insistence that the process of reaction/interreaction are presented as measurable actions that are temporally discrete. Interaction, in game studies, replicates the notion of classical physics that interactions between objects and the "agencies of observation" do not affect each other (or at such a small/measurable value that it can either be ignored or accounted for) and as such can be treated as bounded objects. An agential realist reading, which insists on intra-actions between player and game as vital to their emergence, challenges this classical notion. Incorporating intra-actions into this thesis' view of games as spatial and narrative objects, affects how game and player are perceived. The boundaries of what/who is considered player and what/who is considered game is negotiated by the intra-action which happens during play. The effects player and game produce in the process of their becoming cannot be precisely measured and attributed to each as a preexisting individual entity as the identity of player and game are generated during that process. As such although this thesis continues to use interactivity to describe points where the human and non-human engage as emerged entities, the term points to discrete bounded actions which can be attributed to a preexisting player or game. The inclusion of intra-action to describe the process of emerging human and non-human agencies provides a shift in how the ontological nature of games is perceived. This shift moves away from viewing games as the result of individual elements acting against each other in a vacuum, but instead seeing the human and non-human elements which make up game and player as continually emerging from the relations which make up phenomena. By shifting the ontology of games in this way, the boundaries of what/who can be considered as co-constructing a game's space or narrative is malleable, porous, and expandable, which opens the way for recognising entities beyond the human as engaged in the becoming of games.

As discussed in the introduction, intra-action is already being incorporated into work in the field of game studies. Linus de Petris and Anders Falk use the term to discuss how the category of gamer and game come into being. They state that: 'a gamer or a game is not made meaningful without the practice of gameplay. Becoming game(r) is a reverberation of intra-actions within the phenomena of a game' (2017:6). As such intra-action is a continual process of becoming, producing temporary boundaries between entities which are either reinforced or renegotiated and as such reemerging from phenomena. In games, Petris and Falk argue that it is the process of gameplay which continually forms what is considered game and what is

considered gamer. As a result, they interpret Huizinga's concept of the magic circle, not as a way to separate games from everyday reality as unique objects, but instead as an example of how 'meaning is made different depending on the intra-actions enacting different agential cuts within everyday life' (2017:7). In this way the magic circle delineates a specific set of intra-actions much in the same way as how the science experiment in Barad's agential realism describes a different set of intra-actions which are entangled with an external reality. By considering games as one way of making meaning through specific intra-actions, Petris and Falk view games not as 'subobjects of ordinary life' (2017:10), to be divided from a perceived real and as such being studied as individual objects; instead, they are as entangled in what is considered reality as much as the world 'outside' the fictional world they generate. It is this element of Petris and Falk's work, that the game does not exact a different reality than what it is entangled in, which I draw on as I move forward to discuss agency, a term also well used in game studies.

A second way of incorporating intra-action into game studies sees the result of these intra-actions as producing a bio-object, a co-constitutive entity of player and game. In 'Game/r - Play/er - Bio-Object' Justyna Janik links agential realism to Tadeusz Kantor's Bio-object, a term taken from theatre studies which describes the fusion of onstage performers with objects. These objects which are joined to the performer are, for Kantor, 'not simply props or the elements of set design but [are] closely associated with the actors and the functions they performed' (Kobialka, 2009:306). Rather than considering the actor and the prop as two completely separated entities, these become fused into a bio-object through performance. Janik applies bio-object to games, stating that intra-action through the process of gameplay results in the fused entity of both game and player. As a combined identity, Janik argues game and player are 'constantly reconfiguring each other, but also do not exist in this form outside this connection' (2018:4). Here the focus is not on the fluctuating boundaries of what is considered a game and what is player, which Petris and Falk have discussed. Instead Janik connects the two in a temporary singular entity - the bio-object – a term which she chooses to embody the entangled nature of gameplay. Janik's account of the bio-object provides a useful way of imagining the entangled agencies of both player and game object through its recognition that these specific intra-actions generate a new ontological category and reaffirming the mutual constitutive nature of the agencies involved in a game. However, there

are difficulties in this position. Janik's examples of the merging of performer and prop are often antagonistic in nature, with the prop exacting a limit on the performer's movement and even seemingly attempting to sabotage the act by coming apart, whilst the performer breathes life into the prop by controlling it and making it move in certain ways. The bio-object is made up of two entities which although they are merged appear to be locked in a fight for either dominance over the other or to keep the bio-object together and functioning in the context of the play. As such, although Janik's categorisation of both humans and non-humans as co-constructing agencies is productive for understanding intra-action, I wish to move away from the bio-object as a way of visualising the entanglement of player and game. This is due to how the term has been rooted in placing human and non-human at odds with each other in spite of the result of a unified performance, as well as my intention to expand the range of non-human entities which are involved in the process of play, and as such in the production of game and gamer, to include NPCs, game space, and the player's external reality. Instead, this thesis will continue with the established categories of player, NPC, and game space, making sure to highlight how these are always in the process of fluctuating with the boundaries between them being constantly renegotiated. Intra-action, as it has been applied to games, envisions the categories of the player and the game as porous and malleable and therefore always being renegotiated as intra-actions occur through the process of play. While both Petris and Falk, and Janik focus on the categories of player (or gamer) and game and how they are renegotiated, this chapter breaks the game down into an entanglement of entities which emerge through intra-action, in order to challenge the distinction between player (agentive human) and NPC (non-human, non-agentive).

In agential realism, as entities emerge through intra-action, agency congeals as an aspect of that entity. Both game studies and agential realism share a preoccupation with agency as a concept which works alongside inter/intra-action. To differentiate between these two radically different conceptions of agency I will refer to the definition often found in games studies as player agency. This is due to a general understanding in game studies to view interaction and subsequently agency as driven by the player. Bettina Bódi's definition of player agency argues that it is a 'meaningful choice expressed via player action that translates into avatar action, afforded by a game's design' (2023:55). Agency is something which players can enact through choice and action, the game plays a supporting role, affording the moment when a player can

choose and act. Bódi's definition makes reference to Janet Murray's foundational text *Hamlet on the Holodeck*, for which player agency is considered an innate aspect of a player. In the chapter, titled agency, Murray is prompt in supplying her definition as 'the satisfying power to take meaningful action and see the results of our decisions and choices' (1998:123). This definition focuses on the human, specifically the human identity of player, with 'our decisions' implying a connection and relationship between Murray and the reader which situates agency as the result of player action. "Our" decisions and choices place us as the site of agency able to act intentionally and observe the results of those actions. Agency is therefore something which can be experienced through interacting with a game's space.

Murray's explanation of agency has been influential in game studies. As Stephanie Jennings notes in her analysis on agency in game studies, she 'often witnessed agency used synonymously – at times interchangeably – with a number of other words, including but not limited to: freedom, choice, control, autonomy, and action' (2019:93). Two of the words in Jennings' analysis, 'action' and 'choice' are used by Murray, quoted in the previous paragraph, when detailing the satisfying power that player agency provides. Other definitions which take inspiration from Murray include that put forward by Gordon Calleja, who states that agency '[i]n virtual environments is the ability to perform actions that affect the game world and its inhabitants' (2011:55). If the player can perform an action and see the effects of that action ripple out into the world, their agency has been made visible. These definitions locate agency as an aspect of an individual; a player brings it to the game or else may generate it using the game as a tool. In both Murray and Calleja's understanding of agency, players are the only entities able to express agency through what Barad specifically says agency is not - 'subjective intentionality' and the 'potential for individual action' (2007:230). The action must originate from the player, and the result of that action is read through the marks left on the game's world.

Murray's influence can be traced in Sebastian Domsch's definition of agency which continues the focus on agency as resulting from choice. Their definition states that agency is not only read through marks made on the world, but through the choice which players made to put them there instead of somewhere else or not at all. He states that 'the appeal of games lies in their promise of agency, in the promise of an openness that is dependent on the player

and her choices. All games are therefore necessarily non-unilinear, since true agency implies choice, and choice implies differing outcomes' (2013:3). By making choices in the game a player enforces their particular version of the world which is different in some ways to another player's version. The intentionality inherent in definitions presented by Murray, Calleja, and Domsch, locate agency as fundamentally dualist in nature. Agency itself being located in the realm of the ideal, it is as Freya Mathews argues 'a function of subjectivity, since it involves not mere motion, but willed or intended motion, where motion can only be willed or intended by a *subject*' (2003:35, emphasis in original). By subjectivity, Mathews means the intentionality to act on the world which exists within the mind rather than in the external world. It is this internal force which when wielded by a subject then has a causal effect on matter external to the self. For the purposes of this thesis, which looks to recognise the agency of non-human entities as integral to games, a theory which locates agency within the realm of the ideal does not work, as intentionality is not inherent in the realm of the material. Instead, the materialist agency that this thesis applies to games locates agency within the realm of matter.

Accounts of games often treat agency as a demand, requiring players to act in order to progress. To highlight the player's role as the initiator of narrative, Michael Nitsche states that 'In contrast to the reader, who follows the events in a book, the player in a video game is obliged to act in order to keep the textual machine working. Agency is not only an option but also a *demand'* (2008:50, emphasis added). Without the player taking action in the game world, there would be no continuation of the narrative and the game would halt. While to an extent this is true, games most often require some kind of player input for them to continue, non-human entities, including NPCs, are also vital elements in the production of space and narrative. As such, it is not solely player agency that is required, but rather the entangled agencies both human and non-human. This is not to say that we should begin to treat NPCs as individual entities capable of subjective intentionality. Instead, what is needed is an alternative structure of agency which incorporates non-human entities rather than attempting to subsume them into a spatial background, or container of the game, as aspects of the matter upon which player agency is enacted.

To build an alternative structure of agency I turn to Barad and agential realism. Agency, in their work, is congealed through the continual process of intra-action, which form the relations

that make up phenomena thus altering the particularities of the settling of agency. By locating agency through intra-actions, the site of agency moves from a player agency which is found innately within the player, to a force that is decidedly not a property of an entity (human or non-human) but found in the relations within phenomena. In the same way that speed is not an attribute of an individual entity; it is something measured in the relations between one object and another, agency is not the property of an object but is found in the relations between objects acted out through intra-actions. I argue that the model of agency often favoured by game studies does not take into consideration the non-human as an entity with impact on the game world and its narrative. Instead, I will suggest an alternative theory of agency in digital games which uses Barad's agential realism as a basis as it challenges human-centric understandings of agency and sees it instead as a congealing force which can be found within all matter human or non-human.

To understand agency within the theory of agential realism it can be easier to start with what it is not. It is not, for example, an inherent quality that human beings have at birth or a quality which is bestowed on humans with age. It is not produced via movement in space, or language, or intention. It is not the potential for a lone being to act as an individual. However, regardless of the amount of sectioning off from what agency isn't, it can be hard to see what agency is in a clear way. The shape of agency doesn't become clear through the filling in of negative space, but it can help recognise the boundaries and identify how that differs from other conceptions of agency.

What *is* agency then? Barad similarly begins by contrasting it with what it is not, responding to received ideas: 'Agency is a matter of intra-acting; it is an enactment, not something that someone or something has. It cannot be designated as an attribute of subjects or objects (as they do not preexist as such). It is not an attribute whatsoever. Agency is "doing" or "being" in its intra-activity' (2007:178). It is the potential of matter to affect how the world becomes, a process which is continually (re)negotiated. It is not the property of an object but found in the relations between objects. What Barad describes is not random, just because the process is continuing in perpetuity does not mean that it isn't possible to predict the result; instead, certain relations are foreclosed and are thus more likely to happen than others. A stone is likely

to stay in one spot moment to moment rather than start rolling of its own accord; however, the potential for rolling and for it to disturb the grass around it is always there. Agency is as such focused on 'the possibilities for changing the configurations of spacetimematter relations' (2007:230) rather than the evidence of change in physical reality.

With an understanding of what agency is as understood by agential realism, I now apply this conception to digital games. To achieve this, I produce my own definition of agency, which argues that:

> Agency is a force which congeals through the processes enacted during play into the entities which emerge from that intra-action. These entities include the player, the controller as well as the digital non-human elements, specifically including, for this chapter, NPCs.

Certain unfoldings of agency are foreclosed due to the specific construction of spacetimemattering. For example, the player's actions are constrained by the mapped abilities on the controller. A comedic version of this is shown in *Portal 2* on the PlayStation 3 where Wheatley asks the player to speak but when prompted to press X to speak the avatar instead jumps, to which Wheatley's response is 'that's close enough' (Valve, 2011). The agencies of the controller as a physical object, the programming of the game, and the player are entangled, each aiding in providing the overall shape of agency which play produces.

Although agency is usually conceived as an attribute of the player in game studies, there has already been some rethinking of agency through new materialisms including agential realism. For example, Bryan G. Behrenshausen draws inspiration from the work of new materialist Jane Bennett to re-think subject-orientated theories of agency. They choose to apply agency instead to an assemblage, in which agency 'names the organization of capacities for action that a specific arrangement of elements might afford' (2013:883). Agency is found, for Bennett influenced theories, within a collection of matter and each assemblage has a unique potential for agentive action. Another examples of agency shifting from being player

centric is Seth Giddings' *Walkthrough: Videogames and Technocultural Form* which uses Bruno Latour's actor-network theory to move agency from something purely human to something which provides 'symmetry of agency between humans and non-humans (whether artefactual, scientific or natural)' (2006:145). Agency is as such found innately within all matter at all times. I have chosen to align with a Baradian agency rather than drawing from Bennett or Latour, due to how agential realism represents agency as a force rather than built through assemblage or symmetrical in all things. Although agential realism presents all matter as having the capacity to be agentive, agency is itself a congealing force, settling within some entities at a higher rate and more often than others. This is due to how the spacetimematter relations emerge, leading to a foreclosing of certain outcomes. To take the arguments of the previous chapter as an example, the number of potential spatial layouts in *The Binding of Isaac: Afterbirth +* is larger than could ever be experienced by one person; however, when the player presses "start game" these possibilities collapse down into one singular layout. In a similar way agency has the possibility to pool into all matter in a multitude of combinations beyond possible experience; instead, these possibilities are continuously collapsing into a present layout, what Barad calls agential cuts. Much like how the algorithm of *The Binding of Isaac: Afterbirth +* influences the structure of a particular layout, the current spacetimematter relations of the world influence where and how agency congeals within matter.

Other applications of an agential realist conception of agency include, Miguel Sicart, in his article 'Thinking the things we play with', which highlights the transformative properties of applying Barad's work to games, for Sicart that is specifically with analogue games. He argues that the agency of the player and the non-human aspects of a game combine and produce both the player and the possible interactions players can have with the game. Discussing the oldest analogue game piece, the stick, he states 'when I become entangled with the stick by playing, its agency is part of what I become related with: what it allows me to do, how it lets itself be appropriated and how it appropriates me' (2023:24). The agency of the stick affects how the player and play emerge, the entanglement of human player and stick defines possible available actions and outcomes to play. I draw on Sicart in my own understanding of non-human agency, as a congealing force which combines with others through play to produce both narrative and space. I will return to Sicart's work in the conclusion when refining how player Presence is considered as an amalgamation of both human and non-human agencies.

Barad's work is also applied to digital games in Conor McKeown's 2019 paper '"You bastards may take exactly what I give you": Intra-Action and Agency in *Return of the Obra Dinn'*. The game puts the player in the role of a detective for an insurance company. They board a boat which has arrived at port with all its crew dead or missing, and, with the help of a magic stopwatch that shows the last few second of a person's life in hologram format, must determine the fates of all aboard including their names, how and where they died, who their killer was, or their location if they are deemed still alive. The game, McKeown argues, is a perfect encapsulation of agential realism's agency, because it restricts player action to only being able to affect the insurance claim they are filling out and not large-scale events in the game's world and the past which have been finalised. Agency in *The Return of the Obra Dinn* (Pope, 2019), McKeown argues, is a better reflection of what is found in *Meeting the Universe Halfway*: 'actions, [the game] shows, are not meaningful for their ability to shape reality - as conventional game studies writing on agency would lead us to believe - but meaningful in their ability to play a co-constitutive role in producing reality' (2019:67). The player's actions in *The Return of the Obra Dinn* do not change anything in the world, apart from filling out an insurance document. It is, however, through working with the game's systems that the player can get information on what has already happened in the world. That the player cannot shape the game's reality differs from games such the *Assassin's Creed* series, which McKeown points to as an example which puts a 'player in too essential a role' (2019:73); instead, games like *The Return of the Obra Dinn* require players to deal with an external world that impresses its agency onto them. The Assassin's Creed series, McKeown argues, asks players to 'play with this digital mediation of history like a God, rather than simply being 'of' the world' (2019:73). The result of such an unrealistic notion of agency is that, for McKeown, agency isn't experienced, rather an abundance of power which becomes absurd. As such McKeown has chosen his case study specifically to provide a model for how an agential realist idea of agency could be realised121. However, while McKeown is correct that *The Return of the Obra Dinn* does provide a useful template for a vision of agency in games which does not place so much emphasis on the player, I would argue that it is not something constrained to only appear in games which are modeled after a specific notion of agency, but instead is something that can be taken into all games. A game such as *Bloodborne* appears to be operating with a heavy emphasis on player agency: to progress the narrative requires the player's input. It is within the game's fictional narrative,

however, that the idea emerges that only the player's avatar can end the perpetual night. This blurs an idea of player agency with a fantasy of character agency, which manifests as the ability to (re)shape reality. In the reality of gameplay, however, the player can only act in ways allowed by the code, and through the controller, and the game will only continue if the player follows the prescribed path, defeating a boss and then successfully making it to the next boss.

While *Bloodborne* might appear to privilege player agency in its narrative, agency for Barad is not something which is only applicable in certain situations. Although it is based on the scientific experiment, Barad argues that agential realism is applicable to much wider contexts. It is a complete restructuring of how the relationship between matter is conceived therefore there are no contexts which are not within the remit of agential realism. Patris and Falk, as I discussed earlier, argue that an agential realist approach to games does not view them as 'subobjects of ordinary life' where the "rules" of the universe do not apply. As such the application of agential realism to game studies should not stick simply to games which provide a good illustration of that agency within the narrative.

Definitions of NPC

With this Baradian notion of agency and intra-action in mind it is possible to consider the import of this for the non-player characters (NPCs) that are the central concern in the following case study. A definition of NPCs is necessary in order to establish the boundaries I am drawing between NPC, player, and game object even though those boundaries are necessarily complicated in the discussion that follows. It seems clear that the boundaries between what is an NPC and what is the player's character are set through the division inherent in its name. Indeed, this is the way that NPC is usually understood – as a character not controlled by a player – an understanding that can be traced back to its early usage in tabletop roleplaying games. The 1996 issue of *Next Generations* defines NPC as being 'taken from the world of pen-and-ink role-playing games, an NPC is a character encountered in an RPG who is not controlled by the user' (1996:38). Although *Next Generations* identifies the 'pen-and-ink role-playing games' as the mode of play in which NPCs appear, more recent definitions such as Clara Fernández-Vara's in *Introduction to Game Analysis* do not point to a particular genre of game, 122recognises the adoption of the term more broadly in game studies. An NPC, she states, is

'[a] character in the fictional world which is not controlled by the player, but rather by the computer or game master' (2015:251). NPCs, then, are not exclusive to RPGs and can be found in a multitude of genres including racing games, first person shooters, visual novels, strategy games, and MOBAs. In addition to not confining her definition to a particular genre, Fernández-Vara proposes the computer or game master as the entities which are in control of NPCs instead of the player. NPCs are as such subsumed into the purview of either the computer or game master rather than being defined as not the player character. Regardless of whether the entity that has control over the NPCs in a game is human or a machine, they must, according to Jordan Mechner, 'engage with the player's character during the in-game action' (2010:117). Their definition also concludes by describing NPCs as 'whom the player does not control' in a similar way to *Next Generations* and Fernández-Vara (2007:117). However, Mechner sets up NPCs as part of a relationship with the player as NPCs are defined by their engagement with the player.

The subtle differences in these definitions of the NPC are productive in the ways that they variously ground the term in its historical context, identify the computer or game master as being in control, and present a relationship between NPCs and the player character. However, in order to understand NPCs from a posthuman perspective it is necessary to present a new definition. All three of these definitions present the player as vital because the NPC is defined through what the player is not. The player is the root of the definition, making them a central figure in how a non-human entity is envisioned, as such these definitions are limiting. In their place it is necessary to develop an understanding of NPCs as intra-acting with the player rather than being defined in opposition to them.

'C is for Character': A Posthuman Definition of NPC

To establish this posthuman definition of NPCs I am going to focus on the 'C' of NPC: Character. In the majority of definitions, NPCs are stated to be characters who are not controlled by the player. However, in these definitions, what is meant by character is left unexplored. The focus of the definition is on how they mechanically fit within a game world – they are controlled by the game system or a game master – but not what a character *is* and how they fit into the game's narrative.

In his work on designing virtual worlds Richard Bartle goes some way towards defining character, stating that NPCs 'look like players' characters, and would think they were the same if given the AI' (2004:287). For Bartle a non-player character is a combination of visuals and behaviours which are similar enough to the player's character that they could be interchangeable but are instead controlled by the game systems. By this definition character in a digital game refers to a cluster of possible actions and behaviours bounded by a visual character model. This cluster is controlled by the game system and engages with the player during play. Bartle also provides a list of eight functions for NPCs in engaging with players. These include: '[b]uy, sell, and make stuff. Provide services. Guard places. Get killed for loot. Dispense quests (or clues for other NPCs' quests). Supply background information (history, lore, cultural attitudes). Do stuff for player. Make the place look busy' (2004:287). All of these are roles which are focused on what NPCs do for the player or how they are experienced by the player. This original list was updated and expanded by Henrik Warpefelt who conducted a survey to gauge how players categorized the roles of NPCs. As a result of his survey Warpefelt specifies eleven functions NPCs can perform in games:

1. Buy, sell and make stuff.
2. Provide services.
3. Provide combat challenges.
4. Provide mechanical challenges.
5. Provide loot.
6. Give or advance quests.
7. Provide narrative exposition.
8. Assist the player.
9. Act as an ally in combat.
10. Accompany the player.
11. Make the place look busy (2015:7–8)

This revised list uses many of the original functions but takes what were singular functions in Bartle's list and expands them into multiple categories. 'Do stuff for the player' becomes 'assist the player', 'act as an ally in combat' and 'accompany the player'. In the majority of

cases a single NPC will perform multiple functions. In *Skyrim* (Bethesda Softworks, 2011), for example, Lydia is an NPC who can accompany the player, be an ally in combat, assist the player, whilst also providing the service of holding onto items the player doesn't currently have space for in their inventory. Regardless of how many of these functions an NPC performs, each one is performed for the player's benefit. While NPCs enact the roles described by Warpefelt, taxonomies such as this these risk reducing NPCs to their ludic functions. By using these possible functions as coordinates for understanding characters in digital games, NPCs are foreclosed as player-centric, limiting their possible interactions. Instead, I propose a definition that accounts for NPCs not solely in terms of their relation to players but rather as sets of processes at the level of visuals, code, and narrative which intra-act with all aspects of a game including game spaces, other NPCs and players. They are, according to such a definition, part of an entangled set of agencies which co-constitute the game accessed at the point of play.

Moving from conceptions of character found in game studies to those found in narrative theory, there becomes clear a humanist thread which unites the two. The term character is human centric as has been noted by narrative theorists such as Mieke Bal who states that characters are 'anthropomorphic figures' who 'resemble people' (1985 [2009]:113) and Monika Fludernik who notes that 'the anthropomorphic bias of narrative and its correlation with the fundamental story parameters of personhood, identity, actionality' are considered as the foundational basis of stories (2009:9). That characters are human or human-like has been considered a truism. In *The Living Handbook of Narratology* Fotis Jannidis defines character as 'a text- or media-based figure in a storyworld, usually human or human-like' (2014). The attributes and features which make up a character are identifiable as "human" even in characters which are not human, such as the rabbits from *Watership Down* (1972). Fiver, the runty rabbit who receives visions of the future, is shown by the narrative to be brave and kind in a way which anthropomorphises125 him, for example when facing Vervain, Fiver says 'very quietly and with no trace of fear […] '"I am sorry for you with all my heart" […] "for your death. Believe me, I am sorry for your death"' (1972[2012]:450). Traits which can be related to by the readers are identifiable in this quotation; Fiver is empathetic, kind, and brave even to those who are a threat to the warren. Regardless of his non-human status, the narrative offers features and traits with which the reader can relate to and use to build a model of Fiver as human-like character. In recent work, theorists such as Marco Caracciolo (2018) identify this

anthropocentricism and find ways to renegotiate the centrality of the human, allowing the agentive force of non-human matter to emerge. I will detail their work shortly, but, note here that, ultimately, they posit that the strategic use of grammar can help recognise126 the agentive power of a flock of cranes, an area of land, the sea, the dead, and the living dead.

Characters also engage with a type of human exceptionalism through their presentation as individually bounded subjects. They are, as Bal states, 'anthropomorphic figures provided with specifying features the narrator tells us about' (2009:112). These specifying features allow readers to identify one character; Fiver for example, as individually distinct from his brother Hazel and from his surroundings. Rachel Hennessy, in 'Encouraging "children of the compost": In search of a posthuman theory of character,' states that current theories of character taught in creative writing workshops 'reinforce the centrality of an individual subject who is separate not only from objects and environment, but from other subjects: technological, human and nonhuman' (2021:2). Characters are entities which are bounded off from everything else in a narrative, they can be affected and changed by other subjects and the environment, but that boundary is maintained throughout.

Digital games inherit these types of humanism in their use of characters in digital game narratives alongside raising the human player into a position of primacy. This is partially due to the similarities between books and games as media created by people and designed for specifically human audiences. As such there are echoes of the human found throughout games as a medium. Bartle states that characters look like the player and in the vast amount of possible player characters they are usually human or anthropomorphic entities. Even in, for example, *Thomas was Alone* (Bithell, 2012) a platform game which sees the player character and non-player characters as four-sided shapes in different colours, which are visually not person-like, their personality and traits come across as person-like through available actions and dialogue. I presentation of NPCs through an individual character model encourages the player to view NPCs as separate elements which are bounded off from other NPCs, game space, game objects, and the player character. Hennessy quotes Iovino and Opperman, who argue that a posthuman theory of character must dismantle this notion and instead present a character 'whose interiority is always in negotiation with 'material forms emerging in combination with forces, agencies, and other matter' (Iovino and Oppermann 2014: 1;

Hennessy 2021:10). To understand a non-human theory of NPCs each character should not be considered an individually bounded entity but instead a set of layered processes which intra-act with the game system.

Marco Caracciolo renegotiates the humanist centre of character in his essay 'Notes for an econarratological theory of character', developing 'a theory of character attuned to the interrelation of humans and nonhuman processes in the "Anthropocene"' (2018:174). He approaches this from an econarratological perspective which Caracciolo points to the theoretical perspective being used in the work of Erin James, David Herman, and Alexa Weik von Mossner to move 'narrative theory beyond its anthropomorphic comfort zone' (2018:174). To 'extricate character from anthropomorphic conceptions' (2018:174) Caracciolo uses grammatical concepts, pointing to reciprocal verbs as a way of balancing the agentive power in a sentence. By saying "The player character and the non-player character fought", rather than "The player character killed the non-player character", both player character and NPCs are afforded agency. While this approach is founded on the textual, Caracciolo's expands these concepts to encompass the treatment of character at the overall narrative level in a way that is more immediately applicable to NPCs in digital games. The grammatical concepts Caracciolo sets out and expands onto narratives look to establish non-human events and elements as actants for the progression of the narrative and to bring human characters into relation with these non-human entities. It is important, for an understanding of NPCs from a posthuman perspective to consider human and non-human characters as entangled within the narrative, as it dismantles the pull to place the human as the central individual entity whose actions cause change. All entities, through this understanding of character are able both able to have127 a recognisable effect on the narrative progress and on other characters.

Alongside these insights from narrative theory to develop my definition of NPC, I also draw on the Weird as a mode which draws attention to the agency of non-human matter. The Weird is a narrative mode which in the introduction to this thesis I argued is defined in digital games as the rupturing of the logic which structures the player's and/or the player's avatar's perceived in-game reality with an external reality which threatens or defeats a conceived human primacy. To disrupt this perceived human primacy and recogn127ise non-human agency the Weird calls into question the bounded individual. In his work on planetary Weirding,

Moritz Ingwersen states that:

> modern fantasies of bounded individuali–m - formerly called upon to safeguard clear dividing lines between inside and outside, above and below, so-called nature and so-called cultu–e - prove increasingly untenable. Instead, what we are compelled to come to terms with are porosities, hybrids, and insurrections from the ground –p - uncanny specters that readers of weird fiction will be all too familiar with. (2019:74)

The Weird erodes and breaks down the previously steadfast boundaries of who/what can be considered a character as those boundaries become entangled with other entities and spaces. Crucially what the reader of Weird fiction must engage with, according to Ingwersen, are 'uncanny specters' a term usually paired with the Gothic genre. In fact, the uncanny is a debated element of the Weird, with theorists such as Roger Luckhurst stating that the Weird is 'not reducible to the Gothic's economy of the uncanny'; instead, the Weird 'invokes a dread that is irreducible, that cannot be reductively interpreted, translated or returned' (2017:1052). For Luckhurst the uncanny cannot exist in the Weird because as a genre it resists anything familiar; it replaces the familiar with an ontological shock of the absolutely unfamiliar and alien. However, his assertion relies on Freud's pairing of the uncanny with wombs, Luckhurst as such draws a similarity between the uncanny and the Gothic as feminine as he states the uncanny 'always leads back to the ultimate familiar home: the womb' and that 'the uncanny inherently domesticates' (2017:1052). Luckhurst does not directly state this but by aligning the uncanny as a specifically Gothic and particularly feminine mode and then placing the Weird in opposition to this infers a false dichotomy of Gothic as uncanny and inherently feminine, while the Weird is decidedly not uncanny, not familiar, and not feminine. Meanwhile theorists such as Brian Onishi argue that the uncanny is a vital component as 'the weird is marked by an uncanny intrusion from somewhere outside of our known reality' (2020:159). The unfamiliar ontological shock Luckhurst proposes is at the heart of the Weird is transformed; instead, Onishi argues that the existence of an external reality which encompasses our own but cannot be accessed is 'the quintessential manifestation of the uncanny (2020:168). The familiarity of our reality is turned unfamiliar as these Weird intrusions occur.

The uncanny is the altering of the boundaries of what is considered alive, the animacy of

what was considered inanimate. Freud quotes E. Jentsch as identifying a core example of what generates these feelings of the uncanny, specifically 'doubts as to whether an apparently animate object really is alive, and, conversely, whether a lifeless object might not perhaps be animate' (1919[2003]:185). Dolls, automata, and other inanimate anthropomorphic figures induce a feeling of the uncanny. What should be familiar, a human form being alive, is questioned and made unfamiliar. In this sense the uncanny is anthropomorphically biased as the forms which elicit this feeling are human-like in their visual construction. Chloé Germaine problematises the exclusion of the uncanny as part of the Weird whilst also arguing that what the Weird offers is 'a puncturing of the anthropocentric bias of the Freudian uncanny, and a corrective to its prohibition against recognising agency in anything other than human' (2023:136). The Weird provides an aesthetic, cultural and narrative mode where there is no requirement of a human-like form to elicit feelings of the uncanny which allows non-human entities which are not human-like to have agentive power in a narrative. It is this recognising of agency in the non-human which is useful for my purposes of understanding NPCs as an agentive force in digital games. The Weird provides a narrative structure which moves the site of agency out beyond the human allowing for different conceptions of agency which can be found in all matter.

It is at this stage, drawing on insights from narrative theory and accounts of the Weird, that I present a refined definition of non-player character:

> Layers of uncanny processes emerging from the phenomena of the game that combine to form an entity whose agency affects the ways in which space and narrative unfold during play.

These processes extend out from the layers of the visual on-screen, the code, and the narrative intra-acting with other aspects of the game system. Clustered together, these processes animate the previously inanimate pixels and code creating a figure which can be identified as a character, an entity which has an agentive effect on the narrative, player, and surrounding space. Being agentive means that NPCs have the potential to affect spacetimematter relations through their entanglement with the player and other non-human entities. NPCs do not have the potential to interact in the game in the same way a player can; instead, NPC potentiality to

affect spacetimematter relations should not be measured by what the player can do. The boundaries of NPCs are continuously renegotiated as intra-actions occur shifting the extension of the layered processes which form what is recognised by the player as an NPC.

Bloodborne

To get a sense of how this posthuman understanding of NPCs functions in digital games it is worth singling out a case study to examine specific examples. The case study I have chosen for this chapter is *Bloodborne*, an action roleplaying game developed by FromSoftware and published in 2015 exclusively for the PS4. In terms of genre, *Bloodborne* is developed in a Weird mode. The inclusion of the Weird, as discussed above, provides a narrative mode which 'is concerned with boundary crossings and blurrings, interruption and change' (Turnbull, 2021:275). As such the game provides a useful base for examining a post-human definition of NPC which ignores previously inscribed human-shaped borders for agency.

Bloodborne was released as part of FromSoftware's Soulsborne games which currently include *Demon's Souls* (2009), *Dark Souls* (2011), *Dark Souls 2* (2014), *Dark Souls 3* (2016), *Sekiro: Shadows Die Twice* (2019), and *Elden Ring* (2022). This set of games has spawned an entire descriptor – 'soulslikes' - for games which use elements of the Soulsborne design (currency which is lost on death until you revisit your corpse, save points which reset dead enemies, vague/mysterious world lore, and punishing difficulty). Examples which use this design include *Lords of the Fallen* (Deck13, 2014), *The Surge* (Deck13, 2017), *Dead Cells* (Motion Twin, 2017), and *Blasphemous* (The Game Kitchen, 2019), with other games including *Hollow Knight* (Team Cherry, 2017) and *Returnal* (Housemarque, 2021) combining Soulsborne elements with other genre conventions (Metroidvanias and Rogue-likes respectively). The game is considered to be a critical and commercial success, generating a 92/100 score on Metacritic and selling two million copies. The *Guardian* gave it 5 out of 5 stars and called it 'elegant, precise, and irresistible' (Parkin, 2015); IGN gave it a 9.1 out of 10 stating that 'Bloodborne delivers an exhausting and exhilarating journey into the depths of madness' (Stanton, 2015); and while Eurogamer doesn't give out numbered scores, they did call the

game both 'The second coming' and 'genius' (Tyrrel, 2015). In addition to these quantitative markers of success, since release the game has garnered a passionate fan community, who pore over the lore (fextralife, 2015), push the boundaries of the game to find hidden content (McDonald, 2018), write mods to extend their time within the world (Nexus Mods, 2020), and create many pieces of artwork and fan fiction in response to its characters and locations (BloodborneZine, 2020). In short, the game is beloved by many who have played it and encourages a productive engagement with the narrative and the space of *Bloodborne*.

The player wakes up as a hunter in the Victorian inspired city of Yharnam on the night of the hunt. They must 'go out and kill a few beasts', creatures which look like the fusion of man with animals, mainly werewolves. As the player moves deeper into the game, they uncover tentacled aberrations, spaces which bend and twist impossibly, and the animation of corpses and other supposedly inanimate things. Ultimately the story ends with the player killing an 'old one' and taking their place within the cycle of the hunt. In terms of actions that the player performs during play, *Bloodborne* is much like *The Binding of Isaac: Afterbirth +*; players engage in a process of uncovering through exploration and combat. This is simultaneously a spatial uncovering, working out the layout of Yharnam and the surrounding areas, and an uncovering of secrets of the history and cosmology of the game world. The secrets include the nature of the School of Mensis and the healing church found in the twisting 'Chalice Dungeons' below Yharnam, what are the School of Mensis making contact with, and what has the result been for the citizens. This is mechanised by the game awarding 'insight' to players as they discover new locations, bosses, etc. The steady building of insight results in the shift from the Gothic to the Weird as when a player gains certain amounts of the resource hidden Weird aspects of the world are revealed. For example, at forty insight the Amygdala creatures can be seen poised on top of most of Yharnam's buildings. It is implied that they have always been there, but it is only now that the player can see them. In addition to enticing players with these mysteries *Bloodborne* offers the player a fantasy of anthropocentric mastery, the player is able to enter the world of Yharnam through their hunter avatar and have a major effect on the world around them. Meg Jayanth in her Game Developer's Conference talk on the game *80 Days*, details how this fantasy of mastery, as seen in *Bloodborne*, is often sold to players through protagonists 'who can solve all the problems' (2017:n.p). The player drives the plot forward by playing in the role of a hunter whose actions are the only way of advancing the game's narrative. NPCs

are used in service of that fantasy with storylines which only develop through the progression of the player either by advancing through the different Moon phases, or by the player picking from a list of options. Although the narrative points to mysteries and creatures which are beyond the comprehension of human minds, the gameplay puts the player in a position of primacy, always able to overcome the obstacle through the violent actions available. This tension is made material by the application of a framework such as agential realism which problematises the positioning of the human subject as the sole site of agency. As such, although all matter is agentive, the constructed nature of games allows developers to pool agency in the player, creating an exaggerated imbalance of narrative agency. This case study interrogates how agency emerges in NPCs and questions what entities are imagined as NPCs, leading to an application of a Baradian framework which shifts the emphasis away from the human or the anthropomorphic to make it possible to regard space as an NPC in games.

Before reaching the arguably radical conclusion that space should be considered NPCs in games alongside those more human-shaped, it is worth delving into what the game presents as an NPC. In *Bloodborne* what is and isn't an NPC is decided by its programming. Although accessing the game's programming is difficult, modder Lance McDonald restored the debug menu, which was previously only available in the limited alpha test of the game, in the retail version of *Bloodborn*e (Mcdonald, 2019). McDonald's work makes possible new insights on the game's structure, including how NPCs have been grouped. To be an NPC the entity must be designated an NPC grouping which is organised numerically. This grouping determines the entities' specific actions and behaviours such as what they attack (either the player or other NPCs). The majority of the entities given an NPC grouping in *Bloodborne* are human or human-like. Even the game's multitude of enemy NPCs are often human-like as they are either humans that have been hybridised with other animals including wolves, slugs, spiders, flies, ticks, and snakes or they are an amalgamation of human parts for example, 'The One Reborn'. There are not many NPCs which can be considered completely non-human: those that exist attack the player on sight and include crows, dogs, and rats. Typical interactions between the player and these non-human NPCs are short and consist of either the player or the NPC being killed.

An example of the type of human NPCs encountered is Adella the nun, who is an NPC players can encounter inside the Hypogean Gaol in Yahar'gul the Unseen Village. Her character

has several story beats, or questlines, which require player action (or inaction) to achieve, her actions can result in the removal of an instance to obtain a 'third umbilical cord', a specific item which is required to activate a different ending. As such the precise triggers and timings of her questline are debated on discussion forums to break down her effect on the narrative, other NPCs, and the space around her.

Fig 12: Adella the Nun

Adella's questline develops alongside the player's actions in game. To first encounter Adella, the player must be killed by a snatcher, which triggers a cutscene of their avatar travelling inside one of the sacks the snatcher carries and being left inside a jail cell. Like the player, Adella has also been brought here by the snatchers to be experimented on. She will not speak

to the player unless they are wearing a set of clothing associated with the Church. On dressing correctly, she asks if there is anywhere safe that she can go. There are three answers the player can give (dependent on if the player has spoken to the NPCs in charge of those areas): 'Tell of Oedon Chapel/Tell of Iosefka Clinic/Withhold Information'. The option the player picks determines where Adella goes next and what happens to her – which makes these aspects of her character player-centric, it is up to the player to act in such a way that progresses her story. Telling her of Oedon Chapel will mean the next time the player fast travels to that location she is there. This is considered by *Bloodborne* guides to be the best course of action as that is the only option where she survives, becoming a vendor NPC providing the player with vials of her blood (a healing item). Notably this is the only option which sees Adella performing a function which aids the player's movement through the game. At Iosefka's Clinic she is experimented on and turned into a blue alien, whilst withholding the information leads to her corpse being found later on. At Oedon's chapel Adella becomes jealous of a different NPC, Arianna, who is another vendor NPC who can be brought to the chapel that offers the player vials of their blood. Although not noted explicitly, if the player takes a vial of Arianna's blood three or more times, Adella will kill Arianna and become aggressive to the player. This stops the progression of Arianna's storyline, which cuts off a way of getting the item 'third umbilical cord' which the player needs to consume three of to access a different ending. At this stage Adella becomes aggressive to the player and will fight them in the courtyard area outside the chapel. Adella, as these different questlines indicate, can exist in multiple spaces, in multiple states, throughout multiple playthroughs. The form that these states take is pre-determined as Adella will always appear in the locations listed above as long as the player takes certain actions. However, Adella continues to affect the narrative as well as the spacetimematter relations of the game even though these affects are foreclosed by what has been programmed. Adella is not an entity with a mind or consciousness; she cannot choose how her story will end or where she will be located but her existence as a digital entity in the game with coded physics and boundaries, a narrative character, and a set of ludic functions, means that she has a rippling effect out into the game. She acts as one of the only members of the clergy the player can interact with without an immediate fight, through Adella the player learns that part of the healing church is falling apart, its members are not safe from the hunt. She also affects the spacetimemattering of Oedon chapel, taking up space in its shelter, and eventually having blood on her hands after killing Arianna. The narrative and spaces of *Bloodborne* are affected by Adella's existence; without

her, while her removal would not drastically change the game, it would result in a different unfolding of the player's understanding of the intra-story world.

Throughout all these iterations of her character, what *is* Adella the nun? It could be considered that Adella begins and ends at her character model, that the boundary between Adella and her surroundings can be visually pinpointed. Boundaries however, according to Barad, are not as simple as they appear. They state that 'At first glance, the outside boundary of a body may seem evident, indeed incontrovertible. A coffee mug ends at its outside surface just as surely as people end at their skins' (2007:155). NPCs would, as such, end at the edge of their pixels. Instead, Barad states that 'there are no intrinsic boundaries', there are no natural occurring borders between bodies, objects, and their surroundings. At the edge of the boundaries which are formulated Barad states that 'what one sees is not a sharp boundary between light and dark but a series of light and dark bands - that is, a diffraction pattern' (156). Diffraction in Barad's words, 'has to do with the way waves combine when they overlap and the apparent bending and spreading of waves that occurs when waves encounter an obstruction' (2007:74). Waves ripple out and meet other waves or barriers which affect how the waves continue onwards. Through diffraction Barad contests the idea of separable boundaries between objects, arguing that as waves are continually creating new patterns by affecting and being affected by other waves, so is all matter. I argue that a version of this diffraction pattern is visible when we look at the 'edges' of NPCs such as Adella, but instead of a banding of light and dark it is the pattern of agency being continually negotiated between NPCs, the player, the game space which congeal from moment to moment forming temporary boundaries from which the NPC Adella can emerge. These boundaries are often foreclosed as Adella's actions are predetermined responses to the outcome of player input; however, they are still being continually renegotiated even if the outcome is continuously the same.

What Adella *is* can be seen to be entangled into the many processes of the game beyond the visual. Adella exists in the programming which affects her behaviour, which outlines the parameters for her carrying out specific actions, as well as how those actions will affect other NPCs in the area. She is a diffractive pattern of agency. Diffraction is a tool of analysis which Barad borrows from Donna Haraway to describe their methodology. It is useful as a metaphor, as diffraction can 'highlight, exhibit, and make evident the entangled structure of the changing

and contingent ontology of the world'; it makes visible the relations which make up the world (2007:74). In digital games diffraction is a useful tool for understanding how agency affects the game and the player. Agency ripples outwards through intra-actions and these ripples are altered by impacting relations and other intra-actions within the phenomena of the game. Diffraction allows for patterns of agency which are exhibited by NPCs to be interpreted by the players with which they are intra-acting.

Utilising diffraction, all waves within an area have an effect on each other, in a similar way the behaviour of other NPCs can have an effect on Adella herself. For example, if the player invites the Afflicted Beggar to the chapel, he will slowly kill off all the NPCs including Adella. The enmeshing of NPCs as affecting each other at the level of the programming means that an NPC's boundaries go beyond the visual and are continually negotiated by the code. The agentive force of Adella can be felt beyond the structuring of behaviour in the programming. In terms of gameplay she is also entangled in the items she gives to the player, her own blood, and the rune she drops on death; they could not exist without interacting with Adella in a specific way (talking or combat). The vials of her blood heal the player's avatar, and, because of this, Adella can be vital in keeping the player alive in the moments they are away from the chapel. Although *Bloodborne* is a digital construction, these elements are still entangled within each other and interact to form an enmeshment of agencies which are vital for the player to make progress within the game world.

In addition to focusing on an individual NPC, I would like to point to an event in *Bloodborne*'s history as a released game which created its own ripples that affected the emergence of NPCs from the phenomena of the game. When *Bloodborne* initially released, a bug was found when running the game for extended periods of time (usually 12+ hours) which resulted in bosses having a significantly reduced pool of attacks. The most viewed showcase of this bug presented two versions of the Martyr Logarius fight, one with his full set of moves, and another where he only swipes forward with his scythe, the latter being much easier to defeat than the former. The reason this occurred has never been verified by the developers but community discussions dubbed it a 'memory leak' glitch, which is when there is a gradual deterioration of system performance over time which is caused by a system not forgetting data that it no longer needs to use and as such having reduced room for new data (Bloodborne Wiki,

2017). As I stated earlier the code is not infallible, errors can happen at the moment of running a program, elements of the code can interact in ways that were not predicted causing these changes. In this case it is not the player interacting with an NPC which causes a reduced pool of moves; instead, interaction in the code has an effect on the NPC's behaviour. The agentive power of the non-human matter of code has enacted a change in the processes that make up bosses such as Martyr Logarius; subsequently, altering how the bosses can interact with the space and the player surrounding them and thus altering how they are perceived by the player. This glitch was patched in the 1.03 update and cannot be replicated on an up-to-date version of the game. This interaction was considered undesirable by the developers and the patch includes a fix for a bug 'that resulted in bosses becoming immobilised' (Purchese, 2015). In its use of patches to alter the possible interactions, the game is not an object which is released and stays static from that point onwards. *Bloodborne*, as well as a large number of games, receive patches to help fix other undesirable interactions within the code or an external modding community who wish to influence what can happen during play. However not all glitches are patched, there are other glitches and bugs in the game which have had an effect on the NPC which emerges from the game that have not been changed. For example, The Friendly Crow of Hemwick is a crow which has not been given the same aggressive behaviours as their fellow crows. This resulted in recognition from some of the player community who often narrativise the crow's intentions. Why this occurs has again not been verified by the developers but this unusual interaction within the game's code has not been patched. Instead, the Friendly Crow of Hemwick exists as a curiosity to be enjoyed by those knowledgeable about the game's deviation from the standard forms of relations between enemy NPC and player.

So far in my analysis, I have examined the human or human-like NPCs of *Bloodborne* through the lens of agential realism. This entails considering NPCs as entangled entities within the phenomena of the game and the player, which emerge through the intra-action of play. The NPCs' existence and actions alter the spacetimematter relations of the game and so they are therefore agentive. However, the anthropocentric nature of these NPCs conflicts with my earlier assertion that the C part of NPC, character, does not need to be confined by anthropomorphic figures. Especially as the Weird, the mode which *Bloodborne* draws on in its aesthetics and story, is, as I have argued, well suited to recognising the agency in the non-human. An agential realist reading combined with a posthuman exploration of character allows

for a more radical conception of what an NPC could be. Specifically, that a game's space is an NPC.

As I stated earlier, NPCs are layers of uncanny processes which emerge from the phenomena of the game at point of play. These processes extend out from the layers of the visual on-screen, the code, and the narrative which interacts with other aspects of the game. What an NPC is, as explored with Adella, is not confined to one particular process; instead, clusters of these processes are what is identified as a singular character. This definition of NPC does not limit the definition of an NPC on the basis of appearance nor actions. An NPC can be non-human, which is an expansive category rather than a limiting one. The possibility for characters in Marco Caracciolo's article included birds, corpses, the undead, and space. In his analysis of Jeff Vandermeer's 'Area X' trilogy, itself an example of the Weird, the Area X in question 'becomes deeply implicated in [the characters'] actions and psychological states (2018:185). This space has an agentive force on the human and human-like characters in the narrative. As such, Area X emerges as a non-human character in the novel, affecting and being affected by the other characters in the narrative. The spaces of *Bloodborne* similarly affect the spacetimematter relations of the game and the narrative by being, to use Caracciolo's words 'deeply implicated' in the behaviour and actions of the human/human-like NPCs and the player. It is the night of "The Hunt" when the player first enters Yharnam, and its city streets affect how the player interprets their own actions and those of the human/human-like NPCs. For example, the fog of Yharnam's streets often conceals a wolf-man ready to attack the player without their knowledge, prompting questions of who is the hunter and who is the hunted within that space. Through the ability to affect the context in which actions are considered, the game space of Yharnam should be considered a character of its own, able to shape how the narrative and space is perceived, as well as affecting what future spacetimematter relations are possible within it, therefore being an active participant in its own becoming.

The game space of *Bloodborne* is not a singular entity and therefore not a singular character. While descriptions of the game discuss its setting as the city of Yharnam, there are also other encompassing areas such as Cainhurst Castle and The Hunter's Nightmare which are connected but discrete areas. In addition to these larger areas there are also spaces contained within, such as, Brygenwerth College, Yahar'Gul, and The Cathedral Ward, and within them

there are also spaces such as Hypogean Gaol and Oedon Chapel. These spaces are connected with each other so that although Yharnam may be considered an encompassing character so are the other spaces contained within. These spaces are entangled, and they both affect each other and themselves. What interactions occur in one space have implications in another, for example, defeating Rom the Vacuous Spider in the Great Lake progresses the night, which progresses NPC storylines as well as changes the visuals of other locations. Meaning that the boundaries which separate out one spatial NPC from another are porous, as they are continually renegotiated. They are, as such, diffractive entities, much like how I described Adella whose character reaches further than the edges of a character model or spatial structure. To detail this notion, it is worth looking at Oedon Chapel, as an example as that is the location where Adella the nun will go to if the player tells her of its existence. It is a part of the larger space of The Cathedral Ward, which is also found within Yharnam. Visually Oedon Chapel is a small place of worship compared to the grand cathedrals the player visits. Its layout allows the human characters to express their personality to the player without dialogue, with those with ill intent hiding behind the many internal pillars, within small nooks in the architecture or loitering on its outskirts. Gameplay wise Oedon Chapel acts as a hub space with numerous spokes which lead to other areas. In *The Fundamentals of Game Design* Ernest Adams describes the hub element as 'a place of comfort or safety, a base to which to return' (2010:368). The chapel is a place of safety which has programmed boundaries to stop enemies from entering the space and killing the friendly NPCs such as Adella contained within. Oedon Chapel also follows Adams' definition by encouraging players to continually return to it, due to it being a convenient location connecting multiple areas, and also to check up on the NPCs which gather there and see if their stories have developed. As such Oedon Chapel's programming acts as a layered process, limiting the possible actions available to players and NPCs to put them in a state of safety while they are within its walls. This interaction between the game's non-human matter, between friendly NPCs, enemy NPCs, and the spatial NPC can be inferred by the player and utilised to check inventory, take a break, or plan a strategy to continue. Oedon Chapel is made up of layers of processes which make up the space as character (it's visual aesthetic, the programming that underpins it, the spatial layout, and the narratives it invokes) and each are affecting how the spacetimemattering of *Bloodborne* unfolds.

Space in *Bloodborne* is not an individual thing but instead is entangled with the other entities (human and non-human) that interact with it, affecting and being affected by their existence. Due to their ability to alter the spacetimemattering of a game I argue that the spaces of Bloodborne should be considered as characters or spatial NPCs. Spacetimematter is a useful term to understand how the layers of processes of a spatial NPC such as Oedon Chapel are entangled within time and matter. This is because space time and matter is not only fused into spacetimematter, but Barad also often expresses it as a verb, spacetimemattering, to demonstrate it is iterative in its own becoming. Rather than thinking of the space of Oedon Chapel as a stage in which the player and Adella can interact, it is part of the entangled phenomena in which Oedon Chapel, Adella, and the player emerge and are renegotiated throughout the process of play.

While thinking of space as an NPC could be considered radical, as characters in digital games are typically thought of as human-shaped or anthropomorphic in their actions and design, it is an inevitable end point of applying Barad's agential realism to digital games. Agency is not an inherent property of any specific entity but can congeal in anything which emerges from phenomena as all matter has the potentiality to affect spacetimematter. As such the possibilities of what can be considered a character, a figure in a narrative which can have an agentive effect on the narrative, expands greatly with this model of agency. This chapter responded to the proposed research question of, how does the non-human matter of AI affect the narratives of digital games by considering NPCs as agentive entities. This chapter has argued for NPCs as clusters of layered processes (including visual, programming, gameplay functions, and narrative) which are entangled within the entire system of game and player which emerge through play. In doing so this chapter responded to the third objective of the thesis: to expand the term non-player character (NPC) to include agentive non-human matter. As a result, what can be thought of as a character expands beyond a limited human-shaped frame. By moving from a programmed NPC such as Adella to consider spaces as characters within digital games, the chapter closes by making an important shift away from considering AI as the singular non-human element which co-construct a game alongside the player. Focusing only on AI risks an unintentional statement that to be a co-constructor of narrative requires an algorithm to be acted out during play. Spatial NPCs anticipates the next chapter's shift from the intra-story world of the game to the external reality of the player, as

environments become characters in the unfolding of the climate crisis. Subsequently, thinking of these non-human entities as characters helps visualise the entangled nature of the phenomena of the game with the player's external reality and aids the process of recognising the agency of non-human entities and the rippling diffractive pattern they create.

Chapter 4: “Game Over Man!” - *Death Stranding*, Ecophobia, and Contextual Spaces

The focus in the previous chapters has been on what occurs within game spaces, at the point of play, and which produces players, games, and narratives. I have deliberately kept the focus on the fictional world of the game, considering the ways in which players, having emerged alongside, or within, the game, interact and generate narrative. In so doing I have been able to discuss the non-human elements of games, AI, and space, through a framework that recognises the agency of non-human entities. This was necessary as entangled space naturally invites a widening of the focus to incorporate all connecting matter due to its scope, which subsequently threatens to become so wide so as to obscure any details that happen on a smaller scale. It is, however, helpful and necessary at this stage to expand beyond the specifics of the text and to address the wider entanglements within which players are situated. To continue to focus on the player and game without exploring the effect of these wider entanglements risks making the unintentional statement that games are hermeneutically sealed objects both physically and socially, which are distanced from the “real” world, rather than an example of a nested space. To continue tracing the spatial entanglements beyond the specifics of a single game text, this chapter focuses on the interactions within the climate crisis and accompanying ecological collapse. By doing so this chapter engages with the fourth objective set out in this thesis’ introduction: to establish game space and narrative to be entangled with the climate crisis through both the physical demands of digital games on the environment, as well as the narrative positioning of the climate crisis both in and outside games. Games are directly contributing to the continuing disaster, as Benjamin Abraham argues games are ‘responsible for as much as 15 million tonnes of CO2 per annum, or 0.04% of global emissions’; this, he continues, makes games ‘more emission intensive than the entire global film industry’ (2022:18-19). To examine the connection of games and the wider contexts from which they emerge and in which they are entangled, the chapter offers a reading of *Death Stranding* (Kojima Productions, 2019) and the plastics which facilitate playing the game, which reveals both a player's Contextual Space, and the game as a physical object as vital aspects from which games and the environment affect each other. *Death Stranding* acts as an example of the ways

digital media utilises ecophobic imagery of ecological disaster in a way which produces non-humans as enemies to be fought and feared, whilst also contributing to the environment's destruction in the player's external reality in terms of its development, production, and continued play. The resulting interactions are foreclosed by setting up both the narrative and the gameplay to reinforce this human vs non-human antagonism, building on human survival instincts as the non-human enemies threaten to harm humans or cause their extinction. The chapter ends by looking past the point of play to a point of time beyond human existence, to revisit the plastic used to play *Death Stranding*, asking where that plastic is, and how the games industry is contributing towards the continuation of the sixth mass extinction.

To examine Contextual Space, an aspect which changes dependent on the player's entanglements, this section takes at times, by necessity, an autoethnographic approach. As this thesis has been focused on situating the player and games as emerging from an entanglement of agencies both human and non-human, autoethnography could be interpreted as a research method which does not match the goals of the work. It is a methodology which is linguistically built from the formula 'autós = self + ethnos = people + graphia = writing' (Poulos, 2021:4) This method is a writing of the self to represent a people or cultural phenomena. *The Essentials of Autoethnography* state that it 'arose out of field ethnography as a way to include the researcher's experiences and insights more directly into accounts of the scene being studied' (2021:4). Throughout the thesis I argue against the notion of an autonomous self which acts on rather than with a digital game. To consider myself as an isolated individual whose experiences can be inserted into my research, rather than emerging as part of it, threatens to devalue any attempt at autoethnography. However, there has been work by feminist new materialists to account for an entangled researcher's experiences. Chau Vu presents an autoethnography, which draws directly on Barad's agential realism, 'as a method of knowing in being' (2018:79). They draw on Barad's work to situate the researcher as existing within, whilst also being constructed by, the research in question. To quote Barad, 'We don't obtain knowledge by standing outside the world; we know because we are of the world' (2007:185). An agential realist autoethnography, as Vu states, is diffractive unlike other iterations of the methodology which is reflective. In this way, the researcher is embedded within, rather than providing a mirror from which to observe, phenomena from an established distance. By

implementing diffractive autoethnographic writing in this chapter, instead of a narrating "I" which seeks to tell a supporting story as evidence of knowledge to a reader, I present a performative "I" which emerges out of the process of sense-making my own experiences. My self, as both a researcher and a player, is continually being produced from an amalgamation of entities non-human and human. An agential realist autoethnography allows for the entanglements that are involved in that process to be traced so that a diffractive pattern can surface from the material-discursive practice of digital games in the world.

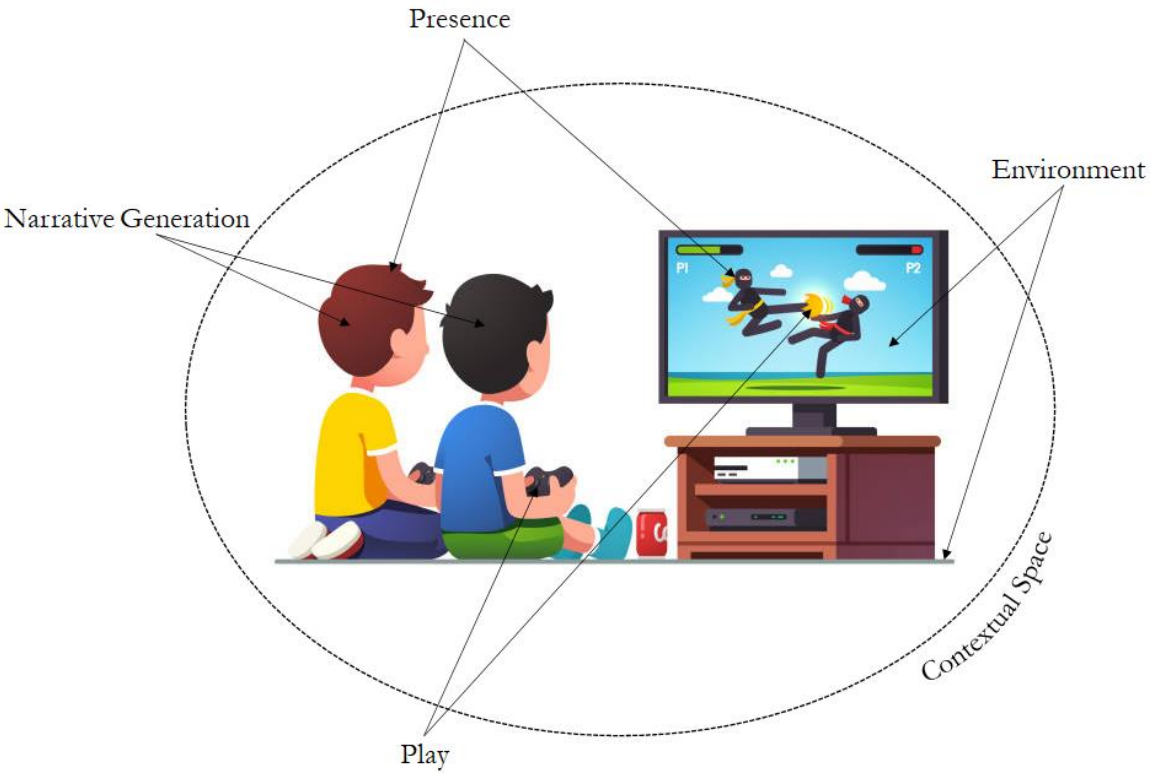

Fig 13: Aspects which make up a player's experience of digital space.

As a researcher using mostly textual analysis throughout this thesis, the experiences I draw from have been my own and as such this case study returns to the aspects outlined in the diagram presented in chapter one 'aspects which make up a player's experience of digital space' (Fig.13) in order to structure my autoethnography. I utilise my own Contextual Space while playing *Death Stranding* to support and explore how the production of game space can be experienced within the climate crisis. As I am focusing on the aspect of Contextual Space it is worth revisiting how it is defined. It may be useful to start by highlighting what it isn't,

specifically that it is not the total sum of a person's entanglements; they are not synonymous terms. Rather, Contextual Space is a continually negotiated set of entanglements which emerge when interacting with a cultural object such as a game. They are continually negotiated as they are not static, being renegotiated between different texts and different play sessions. Contextual Space is complicated, made up of intimate personal entanglements which emerge from and alongside larger cultural, social, and political entanglements. As such although a person's Contextual Space involves a complexity which cannot be completely explored, in this case study I point towards a few key interactions which affected my playthrough of *Death Stranding*. In this chapter I am focusing on the specific entanglements in my own life which I can point to as affecting how I engage with narratives about the environment and oil. This chapter looks at the entanglements which affect those specific interactions between myself, games, the environment, and oil (and as such are a part of my Contextual Space) but may not surface as easily. My Contextual Space when interacting with *Death Stranding* is different than when interacting with *Bloodborne* and is different again when interacting with *The Binding of Isaac: Afterbirth +*. It is also different to someone else's Contextual Space or even my own five years into the future, or tomorrow, or yesterday. Overlap can occur, the difference does not have to be radical, but rather these are new instances which affect any interaction with a game. However, Contextual Space is not a tool for interpreting or translating a game text which a player deliberately consults: it is an integral co-constitutive element of a person which affects how game space and narrative emerge. Although *Death Stranding* was not made with my specific Contextual Space in mind, it cannot emerge during my own play sessions without being co-constituted with my Contextual Space.

The climate crisis is a congealing of agency among both human and non-human entities. Although it is important that as humans we understand our role in the climate crisis, which is a human-made phenomena (Hansen, 2015; IPCC, 2021), it is not something that humans stand apart from and affect from an outside perspective. We are entangled within both our actions and the material agency of non-human elements. In their paper on 'Agency, identity, and "goals" in a relational approach to climate change education' Blanche Verlie acknowledges these connections when they state that 'because we are always acting-with the world, we cannot fully predetermine or limit what those actions should or will be and so we must be open

to creating unanticipated, different climate actions (diffr-actions) *with* the world' (2020:4 emphasis in original). As humans, our actions are enfolded into the many actions which are part of the iterative becoming of the world, we do not act upon the world as much as we are, as Verlie defines it, acting-with the world and the climate crisis. Digital games, as part of the world, are one of the major contributors involved in the process of acting-with the climate crisis, as objects which are created within, take up space (digitally or physically) within, and are played within the world. As such digital games are not only part of the entanglements which form what we understand as the climate crisis but are also folded into the crisis themselves, from their development, shipment, and consumption to how they reinforce harmful notions of nature as a hub of resources open for extraction.

Although my approach for connecting digital games and the environment is achieved through the work of Barad, there are others in the field of game studies and ecocriticism who also endeavor to bring the two into conversation. To draw connections between games and the environment Alenda Y. Chang focuses on the types of participation that digital and non-digital play environments have in common. Chang provides a long list of possible connections games can (but do not necessarily have to) make, which include, 'free, unstructured play without adult supervision […] and hands-on activity with actual consequences' (2019:4). Games and nature are, as such, joined through the overlap of actions and encounters available to a player in both settings. Rather than being diametrically opposed with each occupying a side of the nature-technology dichotomy used by, Chang states, authors such as Richard Louv to diagnose a "nature-deficit disorder" in generations born since the 1970s, the connection that Chang proposes sees digital games as 'a rich limit-case for the claims of environmental scholarship […] where the natural and the digital collide and prompt careful reexamination of our assumptions about nature, realism, and the virtual' (15). Games provide, according to Chang, a sandbox for explorations of the relationship between digital games and nature available to both players and academics. Playing nature- as the title of the book invites- means seeing similarities in how digital nature and non-digital nature is structured. This is most clearly articulated in her final chapter, "Collapse," in which Chang argues that 'Playing at ecological disaster in games may actually strengthen our belief in the reality and fixity of anthropogenic environmental harm' (192). By providing a space to play (and importantly fail) within a complicated and looming issue

such as the climate crisis games allow for players to engage with it and relate the outcomes of their experiences in the game to similar events occurring external to the game world. In a similar way, Hans-Joachim Backe sees digital games as a sandbox; however, the sandbox he presents is built instead for player explorations of ethical positions as he approaches the connection of digital games and the environment through an ethics-based theoretical framework drawn from Miquel Sicart's *Ethics of Computer Games* (2009). Backe states that 'games become ethically- as well as, in our case, ecologically- relevant if they provoke conflict in players by implementing game goals that may clash with a player's extra-ludic values and beliefs' (2017:46). As a case study Backe points to *Red Dead Redemption* which creates an ethical question for players by making digital bison a finite resource which can be hunted to extinction while incentivising that action by adding an achievement named "Manifest Destiny" for acting that extinction out. The tension created by this combination of action and consequence is a space where players can interrogate their own ethical stance. As such, both Chang and Backe treat games as active sites of enquiry for players to use as tools to explore issues surrounding the climate crisis and ecological disasters. While this is useful for ecocritical discussions of games and is something which I will be drawing on in this chapter, both theories do not recognise games themselves as environmental objects. Instead, their understanding of games as a tool to aid a sense of environmental responsibility cleaves to a nature/culture divide where nature is something to be found "outside" which games, as cultural objects, help players to understand. Taking a different line, the framework this thesis follows allows for a complication of a perceived nature/culture divide found in the wider cultural milieu games are produced in, by making clear that these categories are not an intrinsic quality of matter, but instead 'materially and discursively produced' (Barad, 2007:33). By building this framework from the notion that the base units of reality are the relations from which all entities emerge, this chapter figures games and the environment as being produced within natureculture, an inextricably interwoven set of entanglements which are constantly being renegotiated. Following the privileging of relations in agential realism, this framework approaches environment and games by tracing the entanglements from which the player, environment, and game emerge. This set of entanglements, or what I term the player's Contextual Space, are key to understanding the ways in which players interact with games with their understanding of the "real-world" environment and climate crisis.

Death Stranding

To interrogate what I mean by a player's Contextual Space and specifically how this interacts with the climate crisis and adjoining ecological disasters, it is worth introducing the case study for this chapter, *Death Stranding*. This game has been chosen because it typifies a trend in digital games to present the non-human entities that make up the environment as something to be conquered, defeated, or subdued. This emerging trend of ecogames can be seen in games which require players to survive, such as, *Don't Starve* (Klei Entertainment, 2013), *Minecraft* (Mojang Studios, 2011), and *No Man's Sky* (Hello Games, 2016); games which ask player's to extract value from the natural world including, *Farmville* (Zynga, 2009), the *Farming Simulator* series (GIANTS Software, 2008-present), and *Ranch Simulator* (Toxic Dog, 2022); and games such as *Blair Witch* (Bloober Team, 2019), *Alan Wake* (Remedy Entertainment, 2010) and *Until Dawn* (Supermassive Games, 2015), which source their horror within enclosed "natural" environments. *Death Stranding* combines elements from each of these styles of games, asking players to survive with a limited number of tools to get from point A to point B, rewarding efficient extraction of resources from the environment, and situating the objects of horror and fear as part of an aggressive non-human nature. As such, the game allows for the findings of this chapter to be adapted to other games which utilise ecophobic choices in the presentation of its gameplay and imagery.

Death Stranding is a 2019 game developed by Kojima Productions for the Sony PlayStation 4, with a PC version being released in 2020. Following the release of the standard edition, the Director's Cut, which updated the graphics as well as adding in extra combat features, delivery features, and a new set of story quests, was released for the Sony PlayStation 5 in 2021 and for PC in 2022. The game takes place in post-apocalyptic America after the titular "Death Stranding", an event, largely left undescribed, which has led to humans facing their own accelerated extinction. The ramifications of this for continued existence in this fictional world caused by this event form the main part of the story and gameplay. The player embodies the avatar of Sam Porter Bridges, "the man who delivers", whose middle name states his occupation as a porter and last name connects him as being part of the company Bridges. Since the Death

Stranding, America, and it is implied, the rest of the world, have been dealing with infestations of the dead, called beached things or BTs. While BTs can appear in numerous forms, most common are the stationary floating humanoids; however, there are also animal forms of BT which stalk the player. To most humans BTs are completely invisible but for someone with DOOMS they can have some level of visibility, what DOOMS are and how they manifest remains unclear but some link to death seems to be essential. Sam Porter Bridges has "level 2 DOOMS", which means the player can sense a BT's presence but cannot completely see them. In addition to DOOMS Sam is also a "repatriate", which means that when he dies, he comes back, offering a rationale for the character's respawning and adding additional story-based implications.

Human contact with a BT results in a voidout, an explosion of nuclear proportions, the results of which are explained by a character called Deadman, played by Guillermo del Toro, as 'Game Over man.' Contact with BTs is most likely to happen within BT territory, sections of the game world where there is often thick fog; however, a human corpse also goes through a process of "going necro" within 48 hours and unless cremated the corpse will transform into a BT. In addition to the threat of BTs, rain in *Death Stranding* is called Timefall, as the rain rapidly ages anything organic it touches, damaging parcels, as well as ageing an animal or human to a husk within minutes. As a result of these threats the remnants of humanity are divided and isolated from each other, most living in underground prepper bunkers, fearful of large populations of humans due to the potential violence of a voidout. Because of the dispersed and disconnected nature of the people who are left, delivering parcels has become a dangerous but integral service. Porters are people who move through post-apocalyptic America between human occupied places, distribution centres, prepper bunkers, farms, and weather stations, delivering whatever is needed. The Porter is such an important vocation that a group of renegade porters, known as MULEs, stalk the landscape looking to steal parcels as they are, according to the game's data logs, 'consumed by the desire to deliver' and suffering from 'delivery dependence syndrome.' In addition to evading MULEs, porters must also avoid BTs; however, sometimes that is impossible, in those cases to move through BT territory as safely as possible, some porters are fitted with what the game calls BBs, bridge babies. A BB is a baby in a jar attached to their suit that powers machinery which acts as an echolocator for the previously invisible BTs. Deadman explains that BBs work because of their connection to their

‘stillmother’s womb’, their mothers who became brain dead seven months into pregnancy but who are kept alive in a hospital, ‘facilitates a connection between the world of the dead and the BB. And you, in turn, connect yourself to a BB, granting you the ability to sense BTs’ (Kojima Productions, 2019). Sam, and as such the player, is required to carry a BB through most of the game (who is eventually named Lou) to reduce the risk of running into a BT and creating a voidout.

The game begins with Sam Porter Bridges visiting his mother, who happens to be the president of America, on her deathbed in Central Knot City on the East coast. Before she dies Sam ‘enters into a contract’ with her to help rebuild America and stave off the fast-approaching extinction of human life. Part of that contract includes saving his sister Amelie who is being held by terrorists on the west coast. To save her Sam must deliver his way across America, delivering not only parcels but also the chiral network, a futuristic imagining of Wi-Fi which will link everyone into the UCA, the United Cities of America. The main gameplay loop of *Death Stranding* is the delivery of parcels from one location to another. The player navigates Sam between these points by choosing a direction, getting over any physical obstacles in the way (rivers, ravines, cliffs, rocky ground, snow, etc.) through both careful climbing and tools such as ladders and ropes, whilst also avoiding BTs and timefall rain, and delivering the parcels with minimal damage. On doing so whoever is receiving the parcel will evaluate the delivery by giving it a rank based on time taken and the state of the parcel. This rank is accompanied by “likes,” a social media inspired system that stands in for experience points and which allows the player to level up in key delivery skills such as “Stamina,” “Delivery Volume”, and “Cargo Condition.” In addition to the physical delivery, the player also then gets permission to link that node on the map to the chiral network, sometimes this permission is only granted after a number of deliveries but eventually each point on the map joins up. Variation comes from what needs to be delivered, which could be pizza, emergency supplies, bodies, as well as the different obstacles which each route contains which could include, ravines, rivers, cliffs, snow and light combat if players get surrounded by BTs or Mules during their delivery.

As the physical delivery of parcels comprises the majority of gameplay, this results in large portions of a play session taking place between locations, outdoors in post-apocalyptic America. When the game originally released in November 2019, a month before the first

reports of COVID-19 in UK news, reception from reviewers such as Tristan Ogilvie included references to the games 'breathtaking sights' but 'cross-country crawl' mechanics (2019). Later as the game was ported to PC in July of 2020 during the first lockdown in the UK, and the director's cut was released in September 2021 not long after the official end of the third UK lockdown in July 2021, reviews referenced the changed world *Death Stranding* now existed within. Mike Mahardy's review of the Director's Cut, for example, draws attention to how the events of COVID-19 affected perceptions of the game when they stated that 'In 2019, *Death Stranding* was prescient. In 2021, it's downright eerie' (2021). In 2020 and 2021 a game which presented a large, open, natural landscape in which to explore and depicts that space through photorealistic graphics which provide a simulation of external environments, had different meaning for those playing than in 2019. With COVID-19 altering the world *Death Stranding* was being played in it is worth drawing attention to this complex set of entanglements surrounding COVID-19 and access to outdoor spaces and to a game about navigating outdoor spaces which many players, including myself, share. The response to the Covid-19 pandemic meant that many people were locked down in homes across the world, often unable to access the countryside, parks, or other natural landscapes. In March 2020 the UK government put policies in place to try to curb the spread of the virus by ruling that 'people may only leave home to exercise once a day' which meant even those fortunate enough to have green space within walking distance were limited on how much they could access that space (BBC News, 2020). The day-to-day environment of most people was altered drastically during this time. Unable to venture outside many turned to exploring game worlds instead, with the market for digital games increasing by 23% in 2020 from the previous year (Bloomberg.Com, 2022). Games such as *Death Stranding* also were examined in a new light due to the change in circumstances the pandemic created. In r/DeathStranding, the Reddit thread for the game, users discussed their time with *Death Stranding* during lockdowns. One user stated 'When the Pandemic hit I wanted to get out of the house really bad but instead played *Death Stranding* and the experience was very cathartic' (Reddit, 2021). Other commentors have stated that the game has inspired them to go outside and explore 'real-world' spaces post-lockdown with one commentor writing 'thanks to its beautiful landscape and story, the game inspired me to begin hiking again' (Reddit, 2022). These experiences of players during this time period highlights *Death Stranding* as a game which has clear links between its in-game environments and non-game environments,

with many players either comparing experiences between both or stating that the game's open-world has worked for themselves as a substitute when unable to leave their homes.

This invited comparison is one way in which the intra-story space and the player's space is entangled. A player's presence in the game's space and their own external environment allows the player's Contextual Space to interact within the game world and bring to the surface entanglements previously unseen. The complex set of entanglements surrounding COVID-19 and access to outdoor spaces as such affected players' experiences with *Death Stranding*. These players brought within their Contextual Space the experience and knowledge of a contemporary pandemic which influenced how they played, the message they took from the game, and the narrative they generated. How *Death Stranding* is experienced has been altered by this event, as Rich Stanton's review states 'The world has created a lens through which Kojima's latest will always be seen' (2022). A global pandemic provides an example at a large-scale of how a player's contextual space can shift how they experience a game and its spaces and narrative. As an example of its effect on a playthrough, Adam Frank wrote for *National Public Radio* in May 2020, remarking on how the game's themes mirrored their own feelings during the early part of lockdown, he stated that: 'many times, I came away from my time in *Death Stranding* quietly reflective about the ways we build bridges to each other even in peril and isolation. And in these difficult weeks, that experience was so much better than just a few hours of escape' (2020). A player's existence within a contemporary pandemic brings to the surface fresh entanglements within *Death Stranding* and their own external space.

Apart from a Spanish paper entitled 'La crisis del Covid-19 a través del videojuego. Análisis del discurso de *Death Stranding*: una metáfora de la solidaridad en tiempos de pandemia' (López Redondo & Angulo Egea, 2021), which has no English language translation, current academic work on *Death Stranding* has not yet examined the effect COVID-19 has on player experience of the game. Instead, work on the game has examined its presentation of capitalism (House, 2020), women and birth (Gandolfi and Sciannamblo, 2019; Powers, 2020), and perhaps most directly related to the interests of this chapter, the post-apocalyptic environment of ruins. In *Longing, Ruin, and Connection in Hideo Kojima's Death Stranding,* Amy

Green devotes a chapter to the occurring use of beached sea-life and oil spills throughout the game. While Green's focus is on the imagery of beached whales as potent with folkloric meaning, she does point towards an ecocritical approach to this aspect of the narrative. She states that the use of Beaches in the game 'also serves as a warning against environmental destruction, a stark warning that moving forward means enacting genuine and honest changes, rather than either ignoring the planet is in peril or looking back to a fictitious concept of a gilded past' (2021:45). While I agree with Green that these images 'resonate with a theme of ecological warning' (46) I am hesitant to agree with their interpretation of these warnings as presenting a lesson to be learnt and applied to the non-game world. Instead, I argue that these images are ecophobic in nature and these images interact with the player's own Contextual Space to produce a response of fear and hatred. Ecophobia is a term developed by Simon C. Estok in 'Theorizing in a Space of Ambivalent Openness: Ecocriticism and Ecophobia' (2009) which diagnoses an antipathic relationship between humans and the natural environment, cultivated and reinforced through stories and the media. This can manifest as a hatred, fear, or even indifference towards the environment. These feelings become noticeable when observing reactions to the natural world, or to what is considered natural. These spaces, decorated with dead fish and oil slicks, are not able to impart a way of avoiding this fate through their consumption as images; especially as these images of mass aquatic death are impactful because of their familiarity to similar tragedies external to the game world. The game undeniably represents these images as negative, through framing via audio accompaniment, character responses, and gameplay interactions such as drawing these images into boss fight encounters. However, *Death Stranding* does not present a sustained argument about the climate crisis and accompanying ecological collapse. To defeat the encroaching extinction the player must engage in several boss fights which take down the individuals who are either responsible for BTs and timefall or are responsible for speeding up the process of human extinction. In the narrative of *Death Stranding,* it is individuals who control these processes and removing them changes the world's fate, rather than calling for any radical systemic change or collective action. Instead, the game borrows what Green calls 'haunting and sepulchral imagery', which acts 'as reminders of ruination in both the fictional and real worlds' (46). It is this reminder that I argue points towards the game's use of ecophobic imagery as acting as a bridge between the player's Contextual Space and the intra-game world.

In setting out the aims of his book *The Ecophobia Hypothesis*, Estok states that it 'seeks an understanding of irrational fear […] of nature and natural things, and how these fears pattern relationships that are very destructive to our environment' (2018:8). It is this fear, I argue, that patterns the player's Contextual Space of the environment, leading to engagement with games through a combination of ludo-ecophobic play and ecophobic imagery. For Estok 'ecophobia is all about frustrated agency' as the perceived loss of control to nature is at the origin point of feelings of fear and hatred which pattern a phobia (2018:10). These feelings of fear and hatred are a pathological response to the revelation that agency is not exclusive to humans and is not a force which can be wielded to control a separate "natural world". Ecophobia creates the conditions that legitimises human actions which are harmful to the environment. By giving tar an intentionality inherent to ideas of "human" agency, and having that intentionality be towards the extinction of human life *Death Stranding*'s presentation of a non-human enemy is ecophobic. The agency of the non-human in the game validates any action taken by the player to survive. The actions available to players, to hide or fight the BTs, are not inherently ecophobic, as Estok states 'fleeing from a plant that is stalking me for food is not displaying ecophobia. There is nothing irrational about self-preservation' (2019:48). However, as Estok continues 'conjuring up images of plants that stalk people for food, on the other hand, is a perfect example of the ecophobic imagination' (2019:48). *Death Stranding* is an example of this ecophobic imagination. It deploys imagery which borrows visuals from human-caused negative environmental effects such as oil spills and gives these effects the ability to act with perceived intentionality within the narrative to cause human extinction. In the case of the oil spills, these intentionally impede any physical progress through it via the reaching up of limbs which emerge from the tar to ensnare the player and morph into the BTs which hunt the player.

Oil spills themselves are not ecophobic but they are the result of an ecophobic culture which is indifferent to the harm to the environment caused by extraction methods and the risk of leakage that comes from its use and transportation. While the majority of major oil spills are accidental, intentional oil spills also occur, including one of the largest, the 1991 Gulf War oil spill where oil was released in an attempt to stop US forces from making a water landing in Iraq. In addition, smaller, less notorious but more common intentional spills such as the cleaning out

of oil tankers during a voyage without proper care of the spill water add each year to the amount of oil released into the world's oceans (Hassler, 2011). A contemporary player's Contextual Space is likely to include knowledge and images of these types of environmental disasters at their most extreme. Images of animals covered in oil and raging fires on the sea's surface are examples of oil spills at their most obvious; however, the damage caused by accidental and intentional spills are often harder to spot – affecting the base of food webs such as plankton and the larval phases of crustaceans (Campelo et al, 2021). The difference between oil spills and the tar in game is an intentionality in how the tar purposefully targets humans to ensnare and kill, with the tar being able to drag the player into it to start an impromptu boss fight. As a result of the tar's antagonistic efforts to kill the player's avatar, what is environmental and non-human is considered to be an enemy to be conquered via any means. The tar becomes the excuse to exert control over *Death Stranding*'s America and its non-human inhabitants.

Ecophobic actions can be seen in the ways in which the player is expected to engage with non-human elements in the game, with progression only available when the human VS non-human relationship is enacted in play. For example, in most chapters of the game there was always at least one guaranteed moment where I came into contact with a BT in some form, whether it is moving through BT territory to deliver a package or a boss fight. To progress I was required to win the encounter, either by successfully evading or killing the BT. In addition, during early encounters BTs can only be evaded, with stealth being the primary form of engagement. It is only as the game progresses the avatar is given a variety of tools to deal with the threat, including grenades, guns, and a severing tool which can kill a BT while still in stealth. By moving my experience from the position of hunted to hunter, the game further legitimises the violence as I had experience of the outcome if I could not defend myself. To progress in the narrative also requires progression through the post-apocalyptic landscape. The overall direction is to the west, but I found myself moving back and forward along corridors of my own creation which utilised ladders, ropes, and bunkers other players and I had placed. Once a path had been set, I rarely deviated from the route, choosing to stay on paths where I had both knowledge of the terrain and obstacles and had subdued any enemies I had encountered. When picking a route out through the landscape I was encouraged to pick up as many resources as possible so that I could use them to make tools and ammunition which could be used to

further subdue and conquer the surroundings. As such I stripped the landscape along the paths that I had built so that I had enough materials to continue progressing and finish the game. Beyond this subduing and extraction, my relationship with the environment I moved through was limited. I could sit down and admire the view but in doing so I was not progressing in the set narrative, and in some cases stopping was directly disadvantageous to gameplay as taking too much time to deliver a package docked points needed to level up. These actions encourage viewing the game in terms of what value can be extracted in the environment and how those materials can then be used to further human control over the landscape.

Other applications of ecophobia to games can be seen in Sharae Deckard's chapter on the ecoGothic in the edited collection *Twenty-First-Century Gothic*, where she 'addresses the prominence of Ecogothic aesthetics' in contemporary video games by exploring the 'nuclear magnetism in Bethesda Game Studios' *Fallout 4: Far Harbor DLC* (2016).' Deckard describes the game as 'ecophobia become ludic, rendered a source of sheer pleasure', as nuclear disaster shifts from being presented as a potentially world ending horror to 'depicting nature as a waste to be conquered and domesticated through the creation of frontier homesteads where settlers drive back the fog and dark' (2019:185). Ecophobic narratives are, for Deckard, 'suffused with loathing, fear, disgust and horror, often attributing a capacity for retribution to a vengeful Nature, personified as malevolent antagonist' (174). Games such as *Fallout 4* allow for ecophobia to become playable, to be found not only in the images presented but also in the actions available to the player. To play *Fallout 4* as intended is to engage in the process of conquering nature, defeating, subduing, and taming the wilds so as to establish a human-centered society. Deckard's assessment of ecophobia in games also describes the process of conquering nature in *Death Stranding*. In addition to the violent actions available to the player (shooting, stealth killing, throwing grenades) and the actions taken in response to violence or threats of violence (running, hiding, blocking) there are also actions specifically for exploring, conquering, and draining the resources of spaces. The outcome of linking all the surviving humans to the chiral network is to also connect each location physically by conquering the space. The environment leading from one point on the map to another is littered with human placed objects (either placed by the player or an online player the game connects to) which mark the area as explored, allow for easier access, or protect the player's avatar from the perils

of timefall. These actions, as Deckard states about the *Fallout 4* DLC, help in 'depicting nature as a waste to be conquered and domesticated' (185).

Positioning myself as Player

I am writing this thesis as a researcher during the ongoing climate crisis, an issue from which ecophobia thrives as a pathologic response to an all-encompassing complex disaster. While games such as *Death Stranding* present nature as something to be conquered and mined for resources in order to secure our survival, these in-game actions reflect an ecophobic pattern of behaviour in our external reality which instead threatens our survival. Ecophobia is a maladaptive strategy, as the control over nature which these actions seek to establish is hallucinatory; instead, these actions erode control over our continued existence. I was born as the term sixth mass extinction began to be used with more frequency. Below is fig. 14, a google Ngram which highlights the use of the terms "Holocene extinction", "sixth extinction" and "sixth mass extinction", which shows a rapid increase of the use of the term since the 1990s (as seen in more detail in fig. 15).

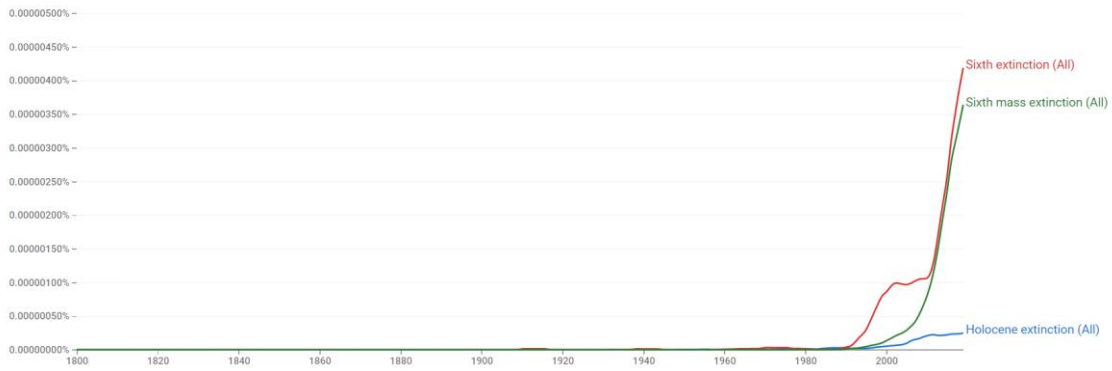

Fig 14: Google Ngram for the terms Holocene extinction, sixth extinction, and sixth mass extinction

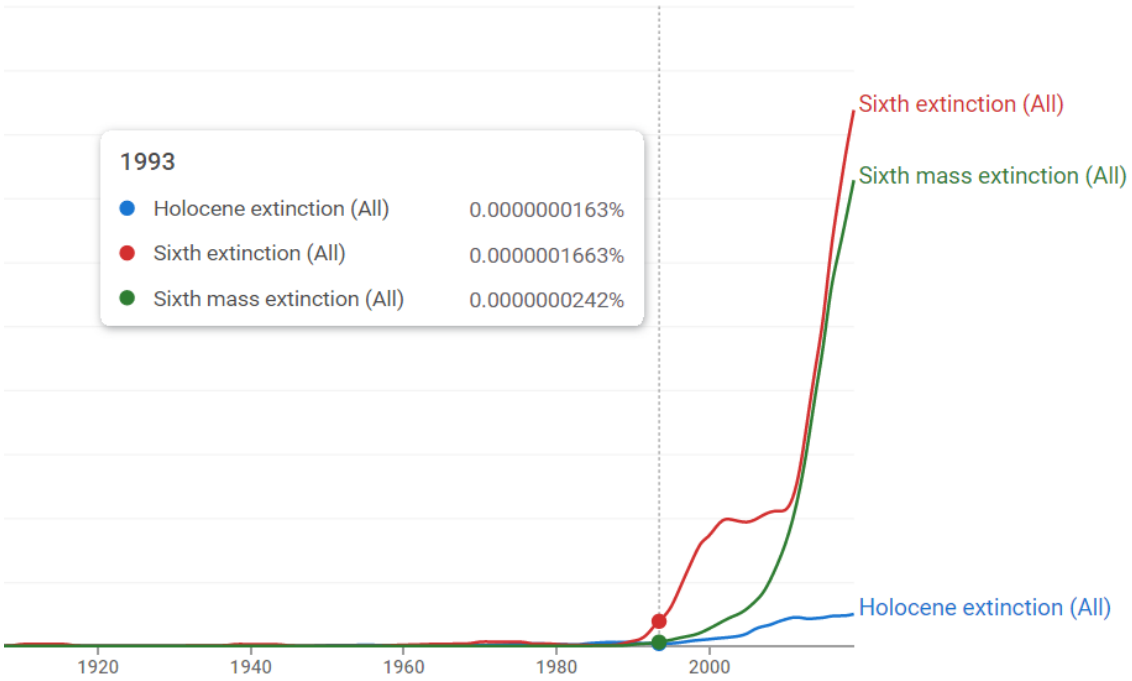

Fig 15: Detailed view of the Ngram from fig. 14. highlighting 1993 the year I was born.

That we are causing a mass extinction and that we are part of the species threatened with extinction is not a recent discovery. In 1996 Richard Leakey and Roger Lewin stated that; '*Homo sapiens* is in the throes of causing a major biological crisis, a mass extinction, the sixth such event to have occurred in the past half billion years. And we, *Homo sapiens*, may also be among the living dead' (1996:245). These theories of extinction challenge human exceptionalism, as we are not exempt from the process of extinction. Rather, humans are part of an entanglement with non-human elements (animals, plants, the environment, energy etc.) which are all affecting and affected by the others, rather than set outside of the entanglements affecting but being unaffected by their own activity.

With these entanglements in mind, I am choosing to begin the case study with the moment I first interacted with *Death Stranding* as a game. Before this point I had encountered it as a piece of marketing, watching trailers, previews, and following the news stories surrounding the game and its auteur director Hideo Kojima's departure from the game publisher Konami. As such talking about the moment I imaginatively travelled into the game

world as a starting point is not technically correct as I was already entangled within the game as a global media object, but eventually I brought a physical copy of the game and sat down in my home ready to play.

During play I am inhabiting both my material body on my sofa, and the avatar on screen. Although it is in third-person I can see that the avatar only moves when I make a corresponding movement. Forward on the left stick moves the avatar (Sam) in the pushed direction, pushing the left and right triggers causes Sam to hold the straps of his backpack to steady himself. These are not one-to-one actions. I am using a controller and these button presses are translated into a physical action in the storyworld; however, it is only through my pushing of buttons that my avatar moves at all. Through Play I am able to have Presence in both spaces at once. When I perform an action in the external world to produce an effect in the virtual world, as part of the process of Play, the entanglement of the I in the "real" world and the I in the game world surfaces. This overlapping presence in both the game and "real" world is what Bell et al call a doubly-deictic "I", a concept they created by adapting David Herman's doubly-deictic "you" so as to show a player's double situatedness. In the initial concept Herman states that 'Double deixis is a name for the ontological interference pattern produced by two or more interacting spatiotemporal frames' (1994:381). Narratives written in the second person are referring to at least two space-time coordinates, one which is internal to the storyworld and the actions taking place, as well as at least one external frame which exists outside the text but is called on by the text's use of the pronoun "you". Bell et al alter the term to identify a doubly-deictic "I" as a term which 'signals movement through space and time as though the reader-player is situated in the storyworld as well as the actual world' (2018:13). This doubly-deictic 'I' can be seen throughout the past few paragraphs where I have used the pronoun I to reflect my actions outside and inside the game world. I turned the game on, I navigated to the cave, I picked up lost cargo. I am both the me existing in my material reality, in my house in Preston in 2022 and a me in the game world which is my embodiment in the game. This occurs, according to Bell et al, due to 'the combination of linguistic cues and reader-player agency' which 'contextually anchors the reader-player in the storyworld' (2018:12). Through both the language used in *Death Stranding*'s opening (the use of 'our') as well as the ability for button presses performed

in the external deixis to affect the player's avatar and surrounding environment a doubly-deictic "I" is able to emerge.

For discussions of Contextual Space, a doubly-deictic "I" is important as it expresses the player's ability to have presence in both the game world and the "real" world which allows a player's Contextual Space to interact with a game's storyworld. To return to Herman's original term, in *Story Logic,* when discussing a scene of pigs being killed in Edna O'Brien's 1970 novel *A Pagan Place*, he argues that the use of 'you' 'reaches those fragments of our world(s) in which pity for pigs is actually to be found' (2002:342). For Herman the fiction invites the external 'you' of the reader to contextualise the events in *A Pagan Place* with their own experiences and knowledge of animal cruelty in the external world. Herman names this 'contextual anchoring'; the 'process whereby a narrative, in a more or less explicit and reflexive way, asks its interpreters to search for analogies between the representations' found within their mental models of both the fictional and non-fictional worlds (2002:331). This is useful for understanding how Contextual Space interacts with a player's Presence, as their double situatedness allows for these contextual anchors to be formed. My notion of Contextual Space builds on Herman's idea of contextual anchors by moving beyond the text as the sole prompter. I position instead the continual interactions within player and game as building a network of entangled anchors which form a space rather than a singular point of reference. As such Contextual Space does not only occur in response to a narrative explicitly asking for analogies; instead, it is produced within a specific instance of the emergence of player and game it is entangled within. While it is embedded within these relations, for this case study I am focusing on tracing the entanglements within myself (with Presence in both the game and outside of it), the game, and the non-human entities which make up the environment (both intra-story and external).

Discussions of space/time coordinates and imaginative travel are entangled not only with presence but also to another aspect, "environment". Barad defines environment as an entity which is produced and produces spacetimematter. They state that 'Bodies do not simply take their places in the world […], rather, "environments" and "bodies" are intra-actively co-

constituted' (2007:171). Environment, as such, is not a background or a space in which other beings live, but an ongoing intra-action which I argue alongside presence is in the process of continually producing the player, the intra-story environment, and the player's external reality. To discuss the space/time coordinates of a player in both their virtual space and in "real" space is to bring their environment into conversations of presence. I, as a player, am present in both my external local environment (my house in Preston, UK) and the material conditions that accompany and shape that presence, as well as present in the intra-story environment and the virtual conditions that accompany and shape how I am present in that space. While these two environments are very different, both in their existence as more digital or more physical spaces, their landmarks (ravines and mountains in *Death Stranding*, The Harris Museum, and Avenham Park in Preston), and how I interact as a part of both of them. By being present in both, I forge a link between the two. My local environment of Preston is nested within larger spaces, the North of England, the UK, Europe, the Earth, and as such the link forged by my presence in both spaces includes these wider encompassing spaces.

In addition to these specific interactions between the environment in the game and the external world, the Contextual Space of the player allows for the emergence of entanglements within both environments in regard to the climate crisis and related ecological collapse. As I discussed at the beginning of this case study, this is by necessity an autoethnographic study of my own Contextual Space as it relates to *Death Stranding* and as a result this section includes interactions that are specific to my material reality. However, my position, as someone worried about the climate crisis and its ecological effects is not unique. My experience reflects that of an international collection of people who have expressed some measure of climate anxiety or ecoanxiety, defined by the American Psychological Association as 'A chronic fear of environmental doom' (2017:68). 'Climate anxiety in children and young people and their beliefs about government responses to climate change: a global survey', published by Hickman et al, surveyed over 10,000 young people aged between 16-25 from ten countries (Australia, Brazil, Finland, France, India, Nigeria, Philippines, Portugal, the UK, and the USA) about their thoughts and feelings about climate change and government responses to climate change. 75% answered that they think 'the future is frightening', with 55.7% saying they think 'humanity is doomed', while 45% of respondents said 'their feelings about climate change negatively

affected their daily life and functioning' (Hickman et al., 2021). As well as this global survey of young people, the figure below shows data used by the UK Office of National Statistics, which found that 63% of all persons surveyed in the UK felt very negative or somewhat negative about the future of the environment (2021). As such although this case study is focused on my own Contextual Space aspects of it are inevitably entangled with, and representative of, a wider context.

	All persons total		
	%	LCL	UCL
How positive or negative do you currently feel when you think about the future of the environment?[4]			
Very positive	2	1	2
Somewhat positive	8	7	10
Neither positive nor negative	27	25	28
Somewhat negative	43	41	45
Very negative	21	19	22
Very positive or somewhat positive[5]	10	9	11
Very negative or somewhat negative[5]	63	61	65
Weighted count			52,112,184
Sample size			3,990

Fig 16: Data from the Opinions and Lifestyle Survey (OPN), about public attitudes towards the future of the environment and the impact of climate change (Office for National Statistics, 2021).

To discuss how the interaction between the game and myself as a player draw on and modify my Contextual Space, I examine an example from my own play experience; the use of imagery which I associated throughout my playthrough of the game with human-caused environmental effects, specifically oil spills, as shorthand for the game's enemies. In the narrative of the game, the event of the Death Stranding brought with its aftereffects which are keenly felt within the environment through the tar belts. The appearance of oil heralds the presence of BTs in the area. If it begins to rain the player can predict that soon they will need to sneak past the enemies; if they see tar however, they have failed in their attempt to avoid the BTs and have

been literally dragged into a boss fight. The proximity of these environmental occurrences with a non-human enemy has the effect of uniting the two into one entity. As such the non-human enemy is perceived as part of environmental effects which are targeted towards the remaining humans in order to, as I will later explain, cause human extinction.

A similar example of human caused environmental effects turning against humans can be found in the appearance of large pockets of tar bubbling up with emerging faces and arms trying to drag the player into itself and towards a boss fight. The tar gives BTs form, when the player is trying to sneak past they appear as floating incorporeal entities, made up of swirls of black speckles, when contact is made they materialise in the game world as these creatures drenched in a black oil substance reaching out to make contact. The tar is also seen in the cutscenes which take place on The Beach, the location between the world of the living and the world of the dead, with the corpses of dead whales, fish, and crabs also covered with this oil slick. During my playthrough I made connections between the tar and a man-made environmental disaster, in this case oil spills. The tar covered BTs have also sparked comparison between the fictional visual and external world visuals of ecological disaster in reviews of the game. For example, Jacob Aron in his review for *New Scientist* states that the game 'is an obvious analogy for climate change, with ghostly creatures that can take the form of tentacled beached whales, slick with an oil-like substance' and that his 'first encounter with [a BT] triggered eco-anxiety' (2019:32). The addition of oil as a vital component of the BT enemies links them to the ecological damage which humans are acting out on the non-human world. *PCgamer*'s early analysis of the game's trailers pointed towards a specific environmental disaster as key to interpreting the trailer's set of expressive images. During the analysis James Davenport stated that 'The oil-soaked beach is evocative of any number of big oil spills, the Deepwater Horizon spill of 2010 probably comes to mind for most' (2016). The Deepwater Horizon spill in the Gulf of Mexico was the largest spill in history where oil gushed into the ocean from the 20th of April 2010 to the 15th of July 2010. Oil spills are man-made events and, in the case of the Deeepwater Horizon, caused by complications in the process of humans drilling into the seabed for oil and gas. The effects of such a spill can be seen in the ecosystems of the areas where the oil collects, usually beaches and rivers, causing devastation to the human and non-human inhabitants.

While I am aware of oil spills such as Deepwater Horizon and the more recent 2021 Gulf of Mexico inferno, my immediate thought was of more personal events from the local history of where I grew up. On the 6th of May 1978 the oil tanker *Eleni V* was sailing 10 kilometeres off the Norfolk coast on a trip from Rotterdam to Grangemouth when it was struck by the French bulk carrier *Roseline* spilling 5,000 tonnes of heavy fuel oil into the sea. The next day the oil reached the shore and polluted 35 kilometers of coastline surrounding Great Yarmouth, including areas which were abundant with shellfish and popular tourist destination beaches. Clean-up of the beaches was an arduous task as the oil had fused itself with the sand. Ultimately, the oil needed to be scooped out by machines and disposed of elsewhere. While this was accomplished on sites considered important such as the tourist beaches of Great Yarmouth, Gorleston and Lowestoft, on many other beaches the oil was removed by hand and buried in trenches at the back of the beach. This spill was logged in the report 'Oil spill case histories, 1967-1991: summaries of significant U.S. and international spills', created by divisions of the United States government and other international agencies, which stated that the *Eleni V* spill 'became the worst case of marine pollution on the English coast since the Torrey Canyon spill, more than 11 years earlier' (1992:73). The spill continued for twenty-five days and had a direct effect on businesses as well as local populations of animals and plants.

In the past twenty years there have been reports about the uncovering of oil on beaches affected by the 1978 spill (Plummer, 2021), (Coates, 2014), (BBC News, 2016a). Coastal erosion has reached the trenches of oil previously buried and has started uncovering these large reservoirs of pollution. While the oil uncovered on these East Anglian beaches has been classified as not dangerous to humans and has been allowed to be covered up and not extracted, the oil poses a significant threat to non-human entities. For example, concerns about the environmental impact have been raised but not resolved at Gunton Warren, a site owned by the Suffolk Wildlife Trust, which has large oil deposits buried on site. What has resulted from that spill over 40 years ago is a material haunting of the local landscape where an ongoing ecological disaster, coastal erosion, is uncovering an earlier disaster. My own entanglements with that coastal community are a part of my Contextual Space which is part of how I interact with *Death Stranding*. While I was not born at the time of the Eleni V oil spill, the effects of that disaster have rippled out into the local ecosystem, affecting human and non-humans. Seeing

small nuggets of oil like the one below in fig.17 during walks on the local beaches has been normal my entire life and I was taught to avoid them as much as possible and to stop the family dog from sniffing or eating them. Oil and beaches have, in my mind, been always connected. While not immediately as dangerous as its counterpart in the game, experiencing oil as an everyday low-level danger which needs to be avoided may have influenced my playstyle of giving tar filled areas a wide birth instead of immediately moving through it.

Fig 17: An example of an oil deposit on a beach in Lowestoft in 2021 (Boggis, 2021)

This aspect of my Contextual Space shifts how I generate narrative while playing the game. Tar appears wherever contact is made with BTs. It pools out of the earth and gives the BTs a form with which it can grab at me as I attempt to run away. After the danger has passed, either I have defeated the BT or I have successfully escaped, the tar disperses back into the ground. Later my avatar is told, by the character Heartman, that there is evidence in the soil that Death Strandings have happened at the same time as previous ancient mass extinctions. From that point onwards during my playthrough these extinctions were connected not only through the mass death they inflict but through the tar which I connected in the writing up of notes at the end of a play session as the same tar previously naturally buried within the earth, being drawn upwards by the BTs to attempt another extinction event. After my initial playthrough, I read

external materials such as the fan created wikis, which stated that 'tar is the manifestation of the Beach', a connecting space between the realms of the living and the dead, and as such it does not come from or disappear into the earth. While where the tar comes from in this external material differed from my own interpretation, the combination of tar and beach aligned with my own personal entanglements with oil. Neither of these interpretations are necessarily wrong or false, although the amount of support the texts gives each will vary. Instead, the act of generating narrative in games is an act of 'poaching' (de Certeau, 1988) from a variety of sources. As each player poaches from a different set of sources, including their own Contextual Space, the narrative generated may share commonalities but will likely also differ from those of other players, with sources such as wikis offering a unified interpretation to be shared.

Oil spills represent threats to both human and non-human lives, at both the initial point of the spill and in the aftermath. A major example being the Deepwater Horizon spill of 2010 in which eleven workers were killed in the initial explosion which caused the disaster. In addition to the loss of human life, the effect on non-human populations was also deadly. The Center for Biological Diversity found that:

> the spill likely harmed or killed about 82,000 birds of 102 species; about 6,165 sea turtles; as many as 25,900 marine mammals; and a vast (but unknown) number of fish — from the great bluefin tuna to our nation's smallest seahorse — plus oysters, crabs, corals and other creatures. (Center for Biological Diversity, n.d.)

Where spills happen within on-land communities, such as the heavy crude oil pipeline ruptures during 2020 and 2021 in the Ecuadorian provinces of Napo and Sucumbíos, the continued existence of both human and non-human groups in that space are threatened. The multiple oil spills in the region contaminated the water of indigenous Kichwa communities: killing off fish and forcing the human population to be reliant on water and food being delivered from external sources (Aljazeera, 2022). In contrast to the indiscriminate harm oil spills create in the non-game world, Death Stranding's spills differ as they focus on affecting only human targets. Tar can erupt from any point where the player is caught by a BT, affecting their ability to move freely through an area as hands reach out of the tar looking to drag any nearby human. Once

the BTs are defeated the tar disappears as if it had never been there, unlike the oil of the *Eleni V*, which recurs with the erosion of the local area. The tar is used as a hunting (and haunting) device by the non-human enemies to attack and subdue any humans that wander into its territory. Ecological disaster becomes a weapon to wield against the human player, which means that during play the available actions a player has are often ecophobic as the narrative and the gameplay are fixed on battling non-human forces for the sake of human survival.

Death Stranding's reliance on the products of oil

Oil is presented in the game as wholly negative, being considered as unnatural, specifically concerning the breakdown of barriers between the world of the living and the world of the dead. The game theorises this breakdown of barriers caused by the tar in its data logs and emails between characters, accessible to the player through the game's menus. In the emails one character explains to the player character that 'tar may function as a medium to summon the past into the present', while its data logs include an interview which theorises, that 'it might be some byproduct of the beach, and that if you could somehow retract the flow you'd end up there' (Kojima Productions, 2019); the beach being a transitory space the recently deceased pass through on the way to the afterlife. In both cases the tar acts as a bridge for the dead to enter the world of the living and to capture the player avatar to transport them to the world of the dead via a boss fight. However, reliance on oil in the society of Death Stranding appears to be non-existent compared to our own external reality. The technology of the world seems to have moved on. All vehicles are charged via electronic points, and the chiralium network is based in the cloud with seemingly no server farms, wires, or machines apart from the combining of a 3D printer and job board which players interact with at each waystation. To emphasise this "clean" technology, when the player links up the chiralium network to each outpost a small cutscene showing a flash of the network infusing into the space includes images of underwater plant life; indicating a submergence within the network as well as its status as a "natural" and "clean" source of energy in comparison with the oil-soaked physicality of the BTs. The chiralium's presentation is deliberately problematised by the game in its final few hours, when it becomes evident that the network is the work of the human and non-human elements, led by Amelie, which are working towards human extinction. The network leads to an increase in the oil spill imagery, with the player experiencing increased BT activity in the

areas where the network has been connected. The chiralium network's hidden reliance on oil and propagation of its products is a useful point of similarity between the in-universe narrative of *Death Stranding* and the external narratives which surround *Death Stranding* as a media object. To play *Death Stranding* is to become immersed in an entanglement of different oil products, which much like the hidden structuring of the chiralium network, is an undisclosed aspect of the games industry. In other words, it is oil and its derivatives that make the game possible both in the sense of the narratives it explores within its storyworld and in the sense of the creation, distribution, and play of the game itself. My contention is that these two 'senses' are connected at all points.

Oil has a diffractive affect within entanglements, agentively altering the becoming of the world. However, most humans do not come into contact with oil through the form it was extracted (crude oil); instead, the majority of contact comes through plastic. The creation of plastic requires a radical alteration of crude oil's chemical make-up, ending with a material which has no aesthetic links to its origin. To produce plastic firstly the raw material is extracted, I am focusing on crude oil, but this can also take the form of natural gas and coal. One way of extracting oil is through drilling into the earth through oil rigs or on oil platforms. In the UK, where this thesis is being written, an alternative form of oil extraction known as fracking has been proposed and protested, which is when the earth is drilled and a high-pressure of chemicals, sand, and water are fired at the shale rocks within to loosen deposits of natural gas and oil. In the North-West England, an area where large swathes of shale rock reserves have been identified, there have already been issues with fracking. The Cuadrilla site in Blackpool was closed after 120 tremors lasting up to 100 hours were measured following the process of fracking (BBC News, 2022). Fracking is environmentally disastrous, with more energy being needed to frack, whilst some of the fracked gas escapes into the atmosphere. On their website, Greenpeace stated on fracking that 'it risks causing air, water and noise pollution. It uses toxic chemicals that may not be regulated well enough. An accident could mean that these chemicals leak into water supplies or cause pollution above ground' (2020:n.p). Fracking, however, is not uniquely harmful as an extraction technique, disasters on oil rigs and platforms were mentioned in the previous paragraphs as having a reverberating effect on the environment but so to does their day-to-day activities. The *Guardian* reported that 'oil rigs in

UK waters released 3m tonnes of carbon through routine "flaring" of unwanted gas totaling billions of cubic feet', making British oil rigs the most polluting in the North Sea (Ambrose, 2020). Although each method of extraction is harmful, whichever method is used the materials need to be transported to locations where the next step towards making plastic can occur: the refining process.

It is at this stage that crude oil is altered into monomers. This is achieved by heating the oil, turning it into vapors which are collected in a fractional distillation tower, which separates the vapors into different fractions based on temperature. After this separation process there are numerous long chained hydrocarbons which require breaking down into the monomers used in the production of oil products such as plastic. Depending on what type of plastic is being made, the monomer required from the crude oil changes. To make ABS plastics, acrylonitrile (C_3H_3N), butadiene (C_4H_6), and styrene (C_8H_8) are drawn out of the refining process (Harper and Petrie, 2003:10). ABS plastics are the most likely plastics used in the creation of a PlayStation 5 controller, although the exact plastic used is not public knowledge. After the refinement the monomers are combined into polymers through polymerisation, a chemical bonding of monomers into chains. It is at this stage that the oil is chemically what we consider plastic. Finally, the polymers are compounded/processed to arrive at the final product of plastic. This usually takes the form of making small pellets of the desired plastic which can then be shipped to factories to be formed into the plastic product required.

Some of these plastic pellets make their way to the factories of Sony and become used in the creation of PlayStation 5 consoles, controllers, and cases for discs. The reliance on plastic however is only one aspect of oil's entanglement in games such as *Death Stranding* as well as more widely across the games industry. Although this chapter examines specifically the use of plastics, specifically in game controllers, it is worth briefly pointing towards shipping and energy to note that the game industry's reliance on oil goes beyond the physical objects which exist in a player's home but is entangled in the process of getting the goods into homes, and powering consoles and controllers in order to play the games. In short, the game industry has an oil problem, one which is inextricably linked to the ways in which players interact with games as narrative objects. Benjamin Abraham, writing in *Digital Games After Climate Change,* details the harmful impact of games on the environments in which they are made and played.

Abraham states that:

> Games are played on hardware that is energy intense and generative of significant ecological harms, both at the time of use and over a device's lifecycle. Made from minerals dug out of the ground using fossil fuels, packaged in plastics derived from petrochemicals, designed and assembled often under intense labour conditions, and finally shipped around the world as part of global supply chains producing value for shareholders (2022:5).

Oil is directly and indirectly involved in numerous points in Abraham's statement - from the energy which allows rare minerals to be mined and for many of the consoles to run, their packaging, to the process of shipping physical copies of games and their hardware across the world. In estimating the carbon footprint of a PS4 game shipped to Australia, Abraham calculates 0.179 kilograms of CO2 per disc, which when multiplied by the 4.5 million game discs sold in the country in 2020 makes for just over 800 tonnes of CO2. In the process of just getting to the shelves of stores across the globe a game disc already releases harmful gases into the atmosphere. This 0.179 kilograms of CO2 estimate per disc is made up of travel by road, sea, and air, all of which utilise oil in the powering of their vehicles. Abraham shows that the games industry contributes to the climate crisis and that by uncovering the harmful ecological practices undertaken within the industry, 'we see immediately that games are distinctly intertwined with the rest of the climate crisis, responsible in some small way for increasing CO2 levels in our atmosphere, and that this process is not separate or distinct from what happens in a particular game' (2022:77). What is occurring in the game spaces of *Death Stranding*, as well as *Bloodborne*, and *The Binding of Isaac*, their use of the materials of the world to convert player action on a plastic controller to images on a screen, contributes towards the effects of the climate crisis on external world environments.

Facing Extinction

When presenting to players the BTs and the environmental effect of tar, the non-human enemy NPCs take actions in order to achieve the removal of the player from the game space. The tar

grabs the player with emerging hands and drags them into a boss fight. These environmental effects are targeting humans and forcing them into life-or-death situations. In the previous chapter I wrote of non-human agency as having the ability to have an effect on the narrative and the space surrounding them without having to make conscious, intentional decisions. This is still the case in *Death Stranding*, as, for example, the placement of rocks- generated by a procedural system- influences how players and enemies navigate the surrounding landscape and how ladders and ropes are placed. However, by coding in a perceived intentionality into these environmental effects by attaching them to AI controlled NPCs, post-apocalyptic America becomes a battleground between the human and the non-humans. This is compounded in the embedded narrative of *Death Stranding* as the BTs, timefall, and tar work to accelerate the extinction of human life. As the game progresses the player learns that Amelie, Sam Porter Bridges' sister, is an extinction entity (EE) whose entire purpose is to bring about the sixth mass extinction, the removal of all life on earth. The environmental effects are created by her to, as she states, 'get it over with'. As such these non-human elements are infused in the narrative with Amelie's intentions, and while Amelie's status as "human" is debatable within the narrative of *Death Stranding*, her human appearance and ability to converse with the player to legitimise her actions means that the narrative and gameplay of *Death Stranding* becomes about pitching the human against Amelie's non-humans where the winner is able to survive.

Death Stranding is a game which allows non-human enemies a measure of human-like agency and intentionality while drawing on players' external knowledge and experience of non-human entities (in this case the environment, the climate crisis, and ecological disaster) to provide those enemies with a motive to be aggressive. Other games that do similar include *DOOM* (id Software, 2016) and *DOOM Eternal* (id Software, 2020), in their conception of competition for energy, and the *Monster Hunter* series (Capcom, 2004 - ongoing) in our relationship to animals, hunting, and deforestation. By presenting continued human survival as the lusory goal (either of the entire species in *Death Stranding* and *DOOM*, or local inhabitants' survival in the Monster Hunter series), players are placed in an us vs them position where human survival depends on the conquering and subduing of both non-human enemy NPCs and the game's space. While this antagonistic relationship between the player and non-humans can be circumvented by altering how the rules of the game are engaged with, this is reliant on

individual players choosing to engage with "wrong" play. Ultimately, for the players engaging with *Death Stranding* as intended, the game uses ecophobic images and actions to present an easy enemy to inspire the player to fight for human survival. In doing so, the game draws on very real issues and threats to human existence, including extinction. While games are not required to provide actionable solutions to real world issues, the game's reliance on human exceptionalism to save the day provides a vision of the world where humans are only entangled in their own actions, not within the agencies and actions of non-human and human entities. As a result, *Death Stranding*, presents a viewpoint of the world as being centered around the human, a viewpoint which may reinforce narratives of non-human passivity already contained within a player's Contextual Space from other human exceptionalist narratives found in our external world environment. These narratives reinforce a need to take from the non-human world without restraint in order to insure human survival.

As previously stated, this thesis is being written during an ongoing sixth mass extinction, one which threatens both human and non-human life. This forms part of my Contextual Space and is directly drawn on by the game as Amelie is trying to also bring about the sixth mass extinction. In a cutscene Heartman puts the current events of the game into context with the external Earth's history. He tells Sam that 'life on Earth has been rocked by many extinctions, great and small, including the Big Five'. The big five likely being referred to are the previous big five extinctions in the external world; the Ordovician-Silurian extinction (440 million years ago), the Devonian extinction (365 million years ago), the Permian-Triassic extinction (250 million years ago), the Triassic-Jurassic extinction (210 million years ago), and the Cretaceous-Tertiary extinction (65 million years ago) (American Museum of Natural History, n.d.). As well as aligning extinctions in the intra-story world and the external world, *Death Stranding*, takes previous extinction events and weaves them into its own sci-fi narrative. The game incorporates these extinctions by presenting EE's as being the cause of this mass death. Amelie is the extinction entity for the sixth extinction but previous EE's are identified within the narrative as having been Mammoths, Dinosaurs, Trilobites, Ammonites, and the frozen "Iceman" likely inspired by Ötzi the Iceman a natural mummy found in 1991 dated as having lived roughly 5,000 years ago. Each EE is responsible for causing an extinction event, whether that is a mass extinction or one on a smaller scale. In combining the fictional and the non-fictional the game invites interactions

of Contextual Space regarding the player's understanding of extinction but also simplifies these events that establish an us VS them line between human and non-human entities.

In reality, extinction is, as Joanna Zylinska identifies, 'first and foremost a process rather than an event' (2018:52). To put this in the terms of this thesis, extinction is a series of entanglements which result in an ongoing crisis. Each of the big five extinctions took place over hundreds of thousands, if not millions, of years as the environment became inhabitable for large percentages of life. In discussing the current sixth extinction Rob Nixon names this process 'The long dyings - the staggered and staggeringly discounted casualties both human and ecological' (2011:2). This difference between presenting extinction as an event perpetuated by a singular cause (such as *Death Stranding*'s Extinction Entities), and a process which implements a slow violence is key part of the fictionalisation of these real threats. Pieter Vermeulen writes about post-apocalyptic fiction in the Anthropocene that 'the genre's reliance on a cataclysmic event […] misrepresents the gradual processes of attrition and degradation' found in actual extinctions (2020:154). *Death Stranding* is part of that tradition, although in a different medium than Vermeulen discusses. Its gameplay and narrative present a world where the root cause of the crisis can be traced to a singular event which can be heroically survived.

In addition, the ongoing sixth extinction cannot be accurately presented as an us vs them scenario. Although the climate crisis, which is a main contributing factor to the current ongoing extinction, is human generated, as a species we are also implicated in the process. To put a stop to the ongoing sixth extinction does not mean fighting some non-human other but instead requires a rapid alteration in our own behaviour as a species and our use of the Earth's resources. However, in the grand scheme of things all life moves towards extinction, Vermeulen begins his discussion of post-apocalyptic fiction by stating that:

> Human life in the Anthropocene is lived in the shadow of extinction. Over the vast span of geological time, life morphs into nonlife, and biological life forms transform into geoforms. The basic entanglement of human and nonhuman lives means that human life is not exempt from this process (2020:144).

We are not exempt from extinction and when viewed at the expanse of geological time, our extinction is an inevitability; however, it is currently expediated by human actions leading to the climate crisis. Extinction is also framed as unavoidable in the dialogue of *Death Stranding*, Higgs, a terrorist set on accelerating a sixth extinction, tells Sam that 'no matter what you, me or anybody else does, humanity has a few hundred thousand years left, tops' (Kojima Productions, 2019). Higgs rationalises his actions as getting on with the inevitable. Regardless of the deeds of Higgs, the efforts to hasten the end of life can be thwarted by the actions of an individual as the narrative events in the game and the available actions for the player are all centred around staving off that extinction for now regardless of its eventual inevitability. Humans, as such, may not be exempt from the process of extinction but for the human survivors of the game's narrative, it is about surviving as long as possible. In a cutscene before one of the final missions Sam Porter Bridges makes an inspirational speech to the team he has brought together through the course of the game:

> But with the shape the world's in, it'll only be delaying the inevitable. […] Nothing lasts forever. Not even the world. But we gotta keep it going as long as we can right? Patch the holes, change the parts, all that. So we can say we had a good run. That we lived.

The game proffers that extinction is inevitable, but that regardless the in-game objective of the heroic human characters is to keep the world going. This viewpoint reduces the non-human to an entity which needs to be fixed, 'patch the holes, change the parts'. The world is a vessel which provides the conditions for life humans need. The game is the process of taming that vessel which has, since the death stranding, begun to reject human life.

Post human extinction: where is the plastic in Death Stranding

In an article for *Aeon*, David Farrier noted plastics as 'undead' materials which will live on once disposed of, far past our own lives. That some plastics take over 500 years to breakdown from their processed form means that the plastic objects we are creating now will exist beyond our own personal lives and likely beyond intergenerational memory. Farrier begins his article by

discussing how James Hutton's 1788 revelation, that geological features are shaped by cycles of erosion and sedimentation, exposed a timeline of the Earth which stretched out much further than had been anticipated. Hutton's expeditions were accompanied by scientist John Playfair who wrote about this encounter with geological time, saying that 'the mind seemed to grow giddy by looking so far back into the abyss of time' (Playfair, 1788, cited in Farrier, 2016). The discovery of sedimentation alters how old the Earth is considered to be, which cannot be easily mapped onto any existing timeline of the world; instead, a new notion of geological time was presented, which was later adapted to be called deep time by creative nonfiction writer John McPhee. It is through the mass creation of oil-based plastics, Farrier argues, that 'we are conjuring ourselves as ghosts that will haunt the very deep future' (Farrier, 2016). It is not only plastic itself which is considered as a Gothic monster, but we are making Gothic entities out of ourselves through our creation of material which will exist long into the future. We are projected outwards into a future which is post-human, past the point of human extinction, to become analogous to the sedimentation which Hutton and Playfair experienced as paradigm shifting. When Heartman shows Sam the fossils found in the sedimentation of the earth depiciting each extinction event, the immediate threat of the game is that soon it could be humans joining that next layer, when in reality our existence is already etched into the soil through remnants of plastic.

While our reliance on "undead" materials makes Gothic entities of ourselves, what does our projected haunting look like in deep time? Vermeulen imagines our ghostly far future through the poem Ozymandias, which presents time's power to decay as affecting not only physical matter but also meaning. Time alters the context of the written phrase, "Look on my Works, ye Mighty, and despair!" from boastful to pitiful. For Vermeulen the poem is 'emblematic of literature's intimate concern with the impossibility of controlling the drift of meaning' a process which is amplified when projected out into deep time (2020:149),. It is this amplification, which extends the timeline beyond human extinction, that exposes the crisis of the Anthropocene as having 'as much to do with a fear of powerlessness as with a realization of our mortality' (149). As the entanglements between digital games, their material objects, and ourselves as players surface as spanning large quantities of time as well as space, the narratives which these objects will continue to tell will occur long after our own deaths.

Vermeulen's presentation of decaying meaning is useful for understanding our interactions with gaming equipment beyond a singular play session; however, his future focuses on the difference between 'stone carvings and accidental scratches', with stone being an extremely long-lasting natural material, rather than the human-processed materials such as oil-based plastics which make up a lot of modern-day objects. It is worth contemplating how Ozymandias changes when his works are made of plastic. Michelle Bastian and Thom van Dooren in their introduction to the special issue of the journal *Environmental Philosophy*, do just that when they refer to Ozymandias, as they argue that the 'finitude of acts of creation' evoked by the original poem, is problematised by the prevalence of plastic in our contemporary society. For Bastian and van Dooren, the longevity of plastic means that 'it is not the dissipation and silencing of our creative and technical works that is feared, but the threat that they might circulate endlessly' (2017:1). Unlike Ozymandias' work, which crumbles into the surrounding desert, with only a few pillars, a decaying face, and a plaque, to mark its existence, our plastic work threaten to exist beyond the point that they are required. Instead of considering plastics as 'undead', Bastian and van Dooren, group plastics as part of a group of 'new immortals' which are built as standing in the place of the Greek gods to allow for 'we mere mortals to once again engage with unpredictable and dangerous beings that wield power over life and death' (2017:1). As well as plastics the new pantheon includes chemical pollutants and radioactive waste, and their powers have 'interpellated us into unfathomably vast futures and deep pasts, with their effects promising to circulate through air, water, rock and flesh for untold millions of years' (2017:1). For this thesis, which utilises the Gothic as a lens to understand non-human agency, it is not just that plastics threaten to circulate endlessly, but also that we, as humans, are powerless to enforce the meaning and rationale behind the matter we produce; instead, that matter is left behind to continue speaking for itself. We become ghosts, not only bound to our plastic remnants, as argued by Farrier, but unable to articulate our reasoning, or communicate at all with any future inhabitants of Earth, with the "undead" plastics, still shuffling across the world, still entangled with matter and meaning long after our own lives have ended.

Before the plastic in our controllers reaches this stage it goes through numerous 'lifespans', which affect our entanglements with this plastic during our lifetimes. Firstly, a game's system has its corporate lifespan, the length of time before that console is not supported any more.

This itself is multi-staged, including the stopping of making new software for the system, the end of manufacturing the console, and the shutting down of servers and digital infrastructure. This is the point where a company stops considering the console as a live product which they sell. For some game systems this can be a console which enjoyed a long corporate lifecycle, such as the Nintendo Wii whose first games (*Call of Duty 3* and *Madden NFL 07*) were released in 2006 and last games (*Retro City Rampage DX+* and *Hawaii: Shakedown*) released in PAL regions in 2020. While other systems such as the Google Stadia have a much shorter corporate lifecycle, being released in November 2019 and discontinued in January 2023. However, regardless of the length of time, gaming systems will be eventually unsupported by the companies that made them.

Secondly game objects have a purpose lifespan, meaning how long the console or controllers work for the purpose of playing games. This could be shorter than the corporate lifespan, a faulty controller or console which gets returned, or it could be much longer. For example, I owned an XBOX 360 and had a wired XBOX controller, while I traded in the console many years ago, I still have the wired XBOX controller as it is useful for playing games on my PC. This can also vary from person to person; when the PlayStation 5 was released, I traded in my PlayStation 4 to help pay for the new system. I did this in the hopes that someone else could get use out of the machine that no longer played the newest games I wanted to play and as an alternative to trying to recycle a complex piece of electronics. Someone could be getting use out of my old PlayStation 4; however, there is no way of knowing now whether that machine has not instead gone to landfill. There is also a thriving retro scene for games, which restore and repair gaming systems for use long after a company has stopped selling them. Regardless of the level of care afforded these material objects, at some point they will stop fulfilling the purpose to which they were originally created, either unable to play the games they were designed to work with, or the demand for their games will diminish. What is left is the physical object itself, made of plastics, circuit boards, wires, and batteries. Controllers are considered to be waste electrical and electronic equipment (WEEE), a specific category which requires special recycling efforts. In the UK in 2021, according to data released by the Environmental Agency, 491,212.552 tonnes of household and 7,118.245 of non-household WEEE was collected for recycling (Health and Safety Executive, n.d.). However, the Health and Safety Executive guidance for WEEE states that ‘every year an estimated 2 million tonnes of

WEEE items are discarded by householders and companies in the UK' (n.p). As a result, an estimated three quarters of all waste electronics and electrical goods do not get collected and instead end up in landfill. And of the quarter of WEEE that is collected, not all items will be recyclable and once the items are collected it becomes hard to track the percentage of WEEE that is successfully recycled. What's left is an abundance of e-waste, which includes games consoles, controllers, discs, and the plastic packaging it comes in. From that data it is likely that a not insignificant amount of controllers are in UK landfill, especially with '3.4 million consoles sold in the UK in 2021', each of which come with a controller and with '10.6 million accessories sold', which are made up of both controllers and headphones (Games Industry.biz, 2022). The amount in landfill will only increase year on year as we add to the expanding realm of undead plastics.

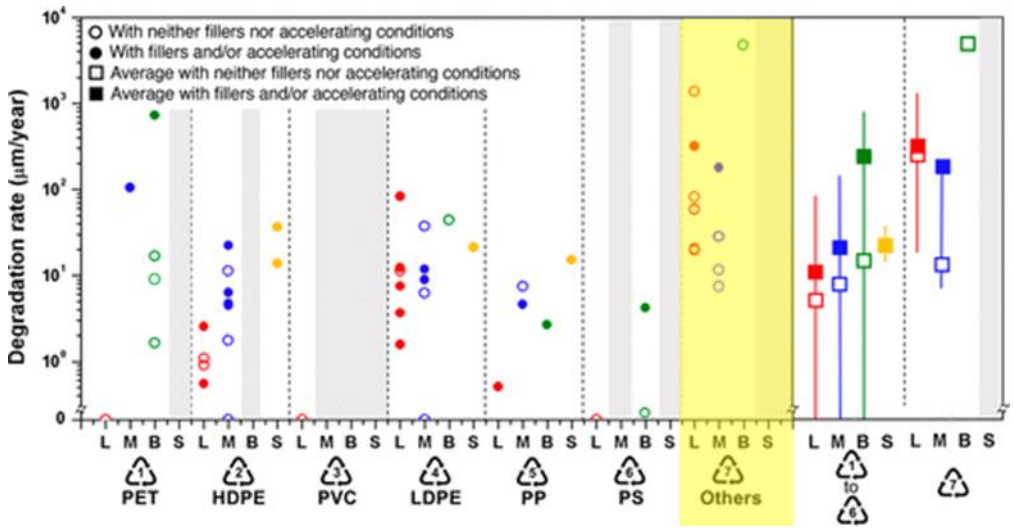

Fig 18: Graph taken from Chamas et al's paper 'Degradation Rates of Plastics in the Environment', edited to highlight plastic with a 7-resin indicator (Chamas et al., 2020).

Chamas et al's study, which summarises existing literature on plastic degradation in environmental conditions, provides a way of predicting the landscape in hundreds or thousands of years' time. Although the exact make-up of PlayStation 5 controllers has not been made public, Sony has stated that their consoles and controllers are made of ABS, which falls under the others category with a 7-resin indicator (Sony, 2021). What the above graph shows is the rate at which different plastics decompose under different environmental conditions. The segment highlighted shows the rate for plastics under the same resin indicator as ABS, in

landfill, marine, and bio (with no data for its decomposition under the sun). From this data Chamas et al estimate the half-life of plastic marked as a 7 in the resin indicator at the thickness of a plastic bag as being 0.035-2.5 years in landfill and 1.7-6.7 years in a marine environment. It should be noted that a plastic bag is an extremely thin piece of plastic with a large surface area, with a PlayStation 5 controller being thicker and denser it would have a much longer half-life than stated in this study. As such although landfill acts as a common final stop in a controller's lifecycle after its function for players has waned, the time spent decomposing will far outstrip its time as a consumer product or a tool to play games.

Throughout this thesis, however, I have focused on the period of time in which a player is playing a game. While researching my primary texts I held in my hands a controller, whose materials have been formed from oil which has previously spent its time deep within the earth and with it, for a relatively small amount of time, I can play *The Binding of Isaac*, *Bloodborne*, and *Death Stranding*, until the controller breaks, or I decide not to play anymore. Its existence as a product which comes from the process of drilling into the earth and heating oil into monomers has harmful effects on the world we live within, and its longevity has implications on the future of this world. Plastic's existence in the world contributes to the diffractive patterns created within the relations which make up the world. According to Barad 'diffraction attends to the relational nature of difference; it does not figure difference as either a matter of essence or as inconsequential' (2007:72). Oil has agentive effects which ripple out into the becoming of the world through a diffractive pattern which is purposefully obscured. The use of plastics in controllers is not inconsequential, as its matter has had to be made and it subsequentially takes up space in the world in the form of a controller. However, it is also not a hard-coded pattern which emanates from the matter itself but is instead found in its becoming from the natureculture practices which produce it alongside the entanglements it exists within. A piece of plastic in a naturalcultural vacuum cannot of its own accord have the effects I am listing, but as part of a connected environment which includes digital games, plastic can have an echoing effect within the world.

From these diffractions we can view the effects which the creation and use of plastic has on the environment - how it combines with other aspects to create the patterns identified. These patterns are complex, and we may not be able to see and categorise each and every

ripple, but it is possible to recognise an overall motif. In the case of plastic in the games industry I have shown that in order to produce the intra-world non-human spaces discussed in this thesis, oil has had to figure in all aspects from their creation, dissemination, use through play, and finally their disuse and decomposition. From the diffractive patterns traced in this chapter, the intra-story world and the external environment are inextricably linked, with the one having measurable effects upon the other. Whether that is the increasing popularity of games requiring more oil to keep up with increased demand for more controllers required to play games, or through the non-human elements of the climate crisis having an agentive effect on how and when we can play in these worlds through increases in temperature, the reliability of energy, and global supply chains. These are aspects not able to be covered in this thesis; however, by tracing the non-human entanglements which players and games move within this thesis hopes to build a basis from which to examine the relationships between intra-game spaces and external spaces.

By focusing on the industry's use of oil in the creation of plastic components which are required for the interaction between player and game to occur, the contextual space surrounding the moment of play widens to incorporate non-human elements which may not be known by the player. Contextual space is a continually negotiated set of entanglements which emerge during an interaction with a cultural object such as a game. It is an integral co-constitutive element from which game space and narrative emerge. I have demonstrated that particular entanglements which make up contextual space can be traced by individual players through an autoethnographic approach. For example, my own history of living in the coastal environment of Norfolk two decades after the 1978 Eleni V oil spill. However, by following the entanglements of oil beyond that in my autoethnography to those used in the gaming industry, this chapter shows that some entanglements do not surface as readily as personal history. Regardless these entanglements still have a diffractive effect upon the becoming of the world, and as such, the nested spaces of game narratives. Plastics are one way of highlighting the affect non-human elements have on games beyond those elements found within games, such as AI and game space, framing game narratives as part of the continual becoming of the world rather than a static element held within a naturalcultural vacuum.

To close I wish to return to the world of *Death Stranding*, while walking through its vision

of America, a futuristic and apocalyptic version of a specific place in our external world, the amount of plastic in the environment is zero. Where is the plastic in *Death Stranding*? Its existence is absent in a world which models itself as a futuristic post-apocalyptic America. There is no reasoning presented by the game although its absence presents the landscapes the player walks through as devoid of human involvement. The player could imagine perhaps that the pieces left have become so small as to be considered micro-plastics, perhaps technology has advanced so far as to pick clean the earth of this oil-based product, or maybe it has been un-made into the oil which threatens the continued existence of the human characters. Regardless, Outside of the cities and small outposts the landscapes look mostly untouched by human hands, it is only as players build ladders, ropes, bridges, and eventually roads that the landscape can appear cluttered with human-made non-human objects. This presents a version of our environment which is only affected by the player's deliberate choices to place an object, rather than a landscape which is continually being produced through the diffraction of the sum total of human intra-actions within its becoming. While this version of the future has expunged plastic detritus from its imagining in its attempts at a realisation of a specific apocalyptic extinction aesthetic, to play it, as I have shown, means engaging with the oil inherent in the games industry. The answer to where is the plastic in *Death Stranding*, or in any game in this thesis, *Bloodborne* or *The Binding of Isaac*, is that it exists at a fundamental level, in the console which runs the game, in the controller which players use to play the game, in the cases for discs. Games and plastics cannot, currently, be imagined as separate elements. However, perhaps by viewing games through the material which is most vital to its existence as an object, in this case oil, can aid in bringing to the surface digital games' entanglements with external non-human elements such as the climate crisis. By grouping games through their shared element of oil, the possibility of an opposing collection of games can emerge, ones whose diffractive patterns in the world would not involve oil, a collection whose entanglements between the intra-game world and the external world would not continue to reinforce a harmful system of excessive oil usage. A realisation of a post-oil collection of games and consoles, in how they are made and played, is required if the games industry is to stop the continuation of harm games perpetuate to the environment through the extraction and use of oil.

Conclusion

The writing of this thesis has been a process of tracing entanglements between players and games. Each chapter has made progress in following these connections outwards, leading, ultimately, to a discussion of the imbrication of games with the wider phenomena of the climate crisis. At the start of this journey I set out my intentions to integrate new materialist approaches with insights from spatial theory and the Gothic to produce a theory of non-human matter as narrative co-constructors, existing alongside, and working with, players, and authors/developers. In this conclusion, I set out the ways in which these three theoretical coordinates have contributed to the mapping of the theory of game space and narratives I have put forward. I have argued that the process of generating narrative necessitates interaction with human and non-human agencies, going further to claim that this interaction is not limited to the scope of an intra-story world, but as part of the everyday existence of the non-human. From production and distribution, through to the individual performance, games, then, are made through engagement with the non-human, which occurs both at the level of the game as well as in the external reality of the game. For example, in *Bloodborne* the player engages with the physical representation of an enemy on screen, the artificial intelligence which puppets the enemy's movements, and the lines of code which produce an effect on screen such as ragdoll physics when the player kills the enemy, simultaneously the player is also engaging with the plastic in controllers, the climate, as well as the production of electricity. As such, this thesis identifies games as sites of collaboration between the human and the non-human.

This theory has emerged through an engagement with a set of initial research questions regarding the role of the non-human plays in the creation of both space and narrative:

1. What is the relationship between space and narrative in digital games?
2. How does the non-human matter of AI affect the narratives of digital games??
3. How are the material conditions required for the production of digital games, as well as the presentation of their intra-story space affecting and effected by the climate crisis?

Each chapter has interrogated one of these questions with the help of case studies of games in the Gothic mode, leading to an incremental expansion of the thesis' scope. The findings have resulted in a shift from the initial statement laid out in chapter one, which viewed games as co-constructed by humans and non-humans, to present game space as a series of processes, (narrative, space, play) which are performed together through humans and non-humans to produce a new unique entanglement of agencies.

Returning to the five aspects of digital game space and narrative:

In the first chapter of this thesis, I presented the diagram below (Fig. 19), which visualized a new framework of my devising for understanding the production of game space.

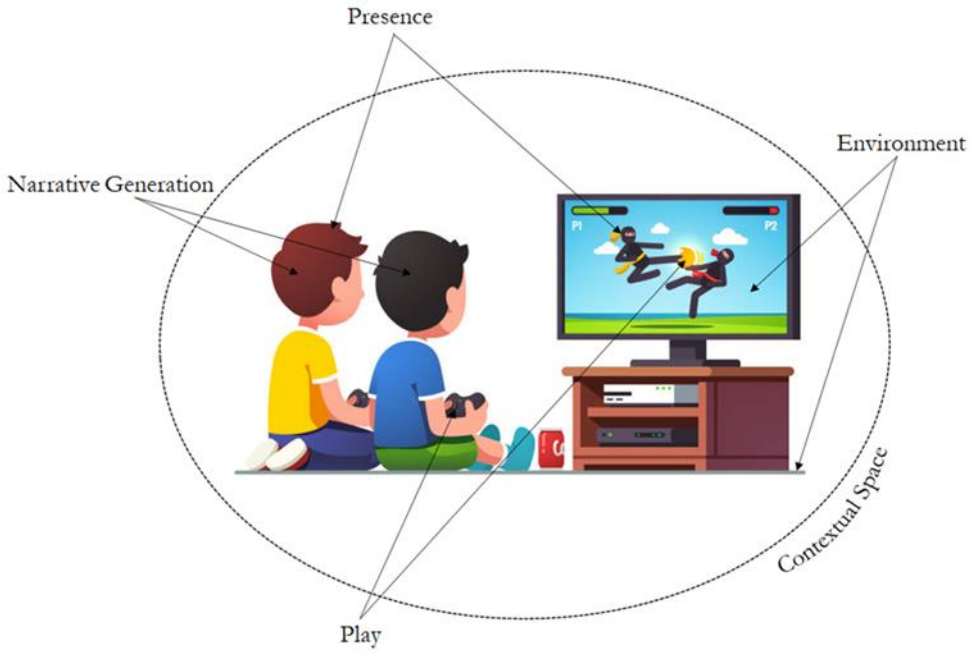

Fig 19: five aspects of digital game space and narrative

The diagram identifies Environment, Presence, Contextual Space, Narrative generation, and Play as the aspects which together produced game space and narrative. Throughout this thesis, I have developed this framework, revising the diagram through case studies in order to refine my theoretical framework through close application to specific game texts. Ultimately, I maintain the position of game space as a performance outlined by theorists such as Melanie Fritsch's who describes the '*performative space* in which all actions induced by the game take place […] as the gameworld' (2014:170) and Clara Fernández-Vara who details performance

space as extending 'beyond the screen' (2009:3). In threading Agential Realism into spatial theory, I adapt to digital games Paul Wake's application of Barad's work in his essay 'Component parts: Board games as architecture and performance' where he argues that the intra-actions between player and games 'suggest the bringing into being of the game performance as a new, and unique, object' (2023:60). As the process of play occurs and game space is performed, what emerges is a different entity than either adding game and player together before play took place, or the game space being performed in a different time or space. It is the process occurring between player and game which produces game space as unique object, rather than game and player acting on each other. I will return to this statement shortly when discussing the changes made between the diagrams presented in chapter one and this conclusion.

In the first chapter I argued that narrative is spatial, and that spaces are storied. While there is story in the spatial diagram presented in chapter one, it is limited to what can be inferred in the image chosen to depict the scene. Two children are playing a fighting game. Player one looks poised to win, although this could also be an underdog narrative setting up an eventual victory for player two. However, as this single image lacks a temporal dimension, we do not see the progression of the narrative. The story within is focused on the happenings on screen, with it replicating the narrative generated in an intra-story world. We can imagine it takes place within a home; however, other contextual clues to location do not exist. We cannot see beyond the zoomed in perspective on this interaction between player and game. The diagram overlayed on top of this snapshot, points to the aspects which make up the production of game space, in itself that does not constitute a narrative.

Below, I will present an updated version of the diagram depicting 'five aspects of digital game space and narrative', now renamed 'A visualisation of nested digital game space and narrative' to better reflect my position that games are embedded in an external reality (Fig. 2). By presenting an updated diagram, one which takes into consideration the refining process each chapter has made on the original theory presented in chapter one, I hope to represent the process as a narrative which the writing of this thesis has explored.

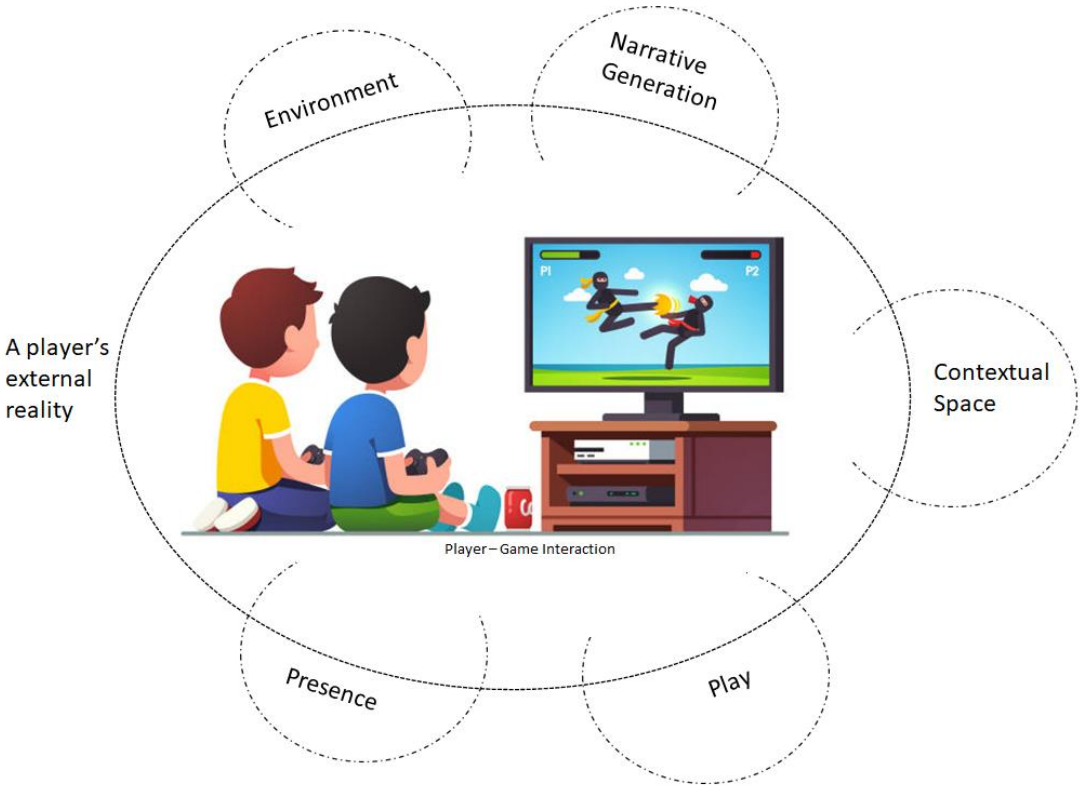

Fig 20: A visualisation of nested digital game space and narrative

The above diagram (fig. 20) offers an alternative structuring of my original diagram. The majority of the main components stay the same; each of the aspects have maintained their original naming, the image is the same, and the dotted circle surrounding the scene remains. However, what has changed is that the diagram has been relabeled and renamed. Previously each aspect was located as emerging from a specific point of the image. For example, Narrative Generation emerged from the players' minds, and Play as occurred through the controller and on screen. In this revised version, these aspects are no longer the properties of individual people or objects; instead, I present the aspects as found within the relationships between people and games. To indicate this, I have moved away from arrows to circles and semi-circles with dotted boundary lines, this is to show each aspect as porous, and overlapping. To aid clarity, I spread out each of the circles; however, a further revision of the diagram might set present them out as a set of overlapping circles whose interactions create game space (Fig. 21).

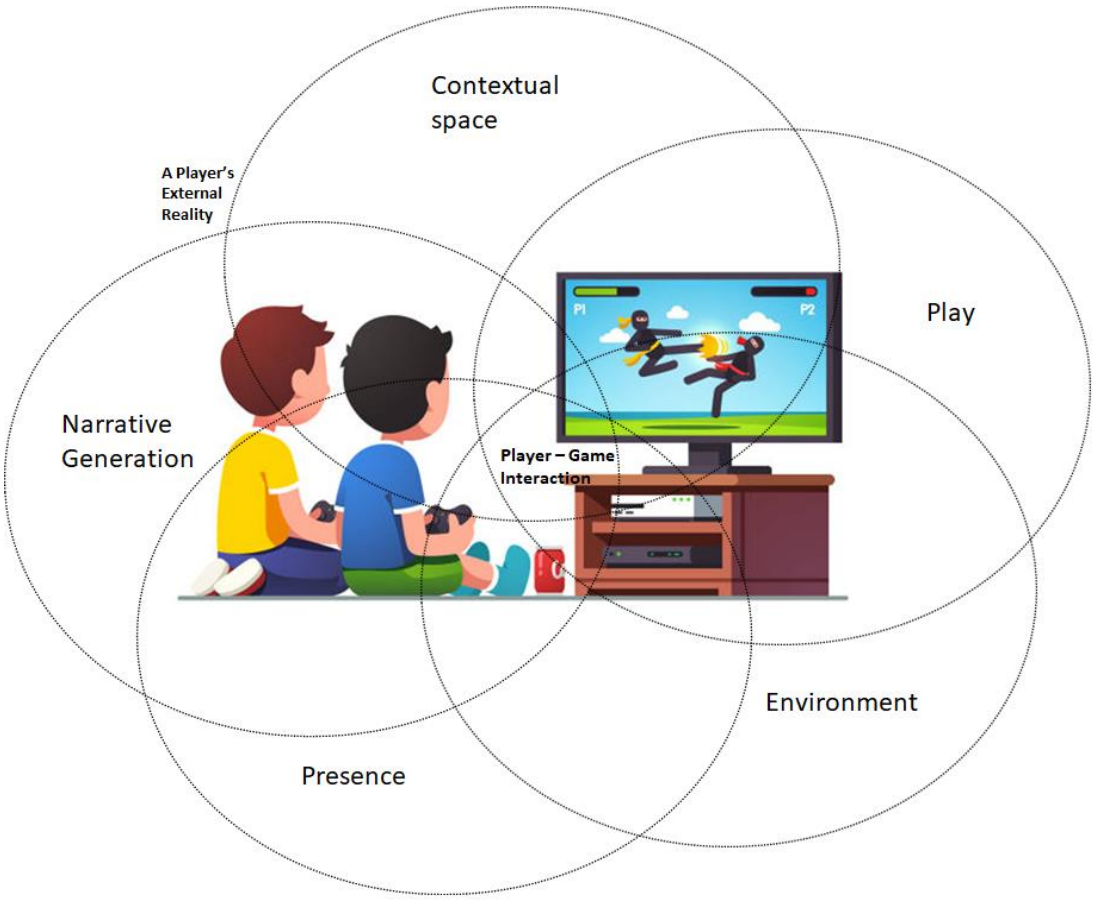

Fig 21: A visualisation of nested digital game space and narrative with extended entanglements.

Both of these diagrams reflect the refining of the theory I have presented of game space and narrative as entangled phenomena, with the word phenomena, following Barad, being defined as 'a specific intra-action of an 'object'; and the 'measuring agencies'; the object and the measuring agencies emerge from, rather than precede, the intra-action that produces them' (2007:128). Space is a process, which is perpetually enacted through a continually occurring set of intra-actions which produce both space and the matter, both human and non-human, that exist entangled in space. Because narrative is spatial and spaces are storied, that space is a process also applies to narrative. Narratives are a process enacted within the relations between human and non-human agencies which surround it.

While the changes to the diagram reflect the inclusion of Barad's theories of entanglements and agencies as a key theoretical coordinate in this thesis, what it cannot show is the journey

each aspect has taken from initial presentation to the end of the thesis. As such I will now take the individual aspects and detail how it has developed through the writing of this thesis.

Environment:

In the first chapter of this thesis I investigated the ways in which the intra-story and external world environments are linked, and explored how uniting environments via the player's perspective allows for a comprehension of game space that goes beyond the digital. At the most basic level, digital game spaces rely on external spaces in order to exist. The player and the game, for example, must be located in an external environment (whether that is a home, a gaming cafe, outdoors etc.) so as to access the intra-story game space. By the end of the thesis, however, I recognize the Environment as an agentive force in its own right, a force that is active in the dual creation of both space and narrative. Indeed, in chapter three, I identify Environment as a 'Character' alongside other human-shaped non-player characters (NPCs). Recognised as characters, game spaces are able to affect the becoming of narrative, not through the same ways players are typically considered agentive in game studies as mostly through choice and action (Murray 2017; Calleja 2011; Jennings 2019) but via the potential to affect the becoming of the world. In making this argument I drew on the work of Marco Caracciolo, who analyses the environment as an active participant in the narrative of Jeff Vandermeer's *Area X trilogy*. The space, Caracciolo argues, 'becomes deeply implicated in [the characters'] actions and psychological states' (2018:185). This space has an agentive force on the human and human-like characters in the narrative. As such Area X emerges as a non-human character, affecting and being affected by the other characters in the narrative. The spaces of *Bloodborne* similarly affect the spacetimematter relations of the game and the narrative, by being, to use Caracciolo's words, 'deeply implicated' in the behaviour and actions of the human/human-like NPCs and the player, with spacetimematter being Barad's way of recognising in language that 'Space, time, and matter are intra-actively produced in the ongoing differential articulation of the world' (2007:234). The Environment in *Bloodborne* shapes the ways in which the narrative and space is perceived, as well as affecting what future relations are possible within it, therefore being an active participant in its own becoming.

In addition, in chapter four of the thesis I explored how concerns about our external environment are impelling our engagement with all forms of media, including games which

produce their own intra-story environment. The climate crisis is a congealing of agency, among both human and non-human entities. While human activity is to blame, the scale of the crisis, its effects, and biospheric processes such as the carbon cycle, uncover humans as being one lifeform of many within an entanglement of agencies which they cannot directly control. *Death Stranding*, my case study for chapter four, utilises the imagery of climate collapse and ecological disaster to locate the player within an us VS them conflict with the intra-story non-humans. This is an example of a Gothic text using ecophobia, Simon Estok's term for recognising agency within the non-human, but in a way which threatens human agency and as such is inflected with horror. The Gothic, in this case, reflects anxieties surrounding our environment and our behaviour towards said environment by recognising and exaggerating non-human agency, presenting a funhouse mirror version of agentive space which treats humans how we have treated the environment.

By drawing on Barad's theorization of agency into the original conception of Environment, notions of who is agentive within a space shift from being based innately within an individual, who is often human, to being a force which continually renegotiated and within all matter. The environment is then considered an agentive character which affects the production of both space and narrative. It is not purely the player who creates a bridge between intra-story space and external reality through their presence in both spaces, but Environment itself is an integral part of how both game space and the player's external spaces are continually being produced.

Presence:

In chapter one, I defined Presence as the space a player occupies during play. Where they are both the avatar in the game andr their location in the external world which situates them as player (in a space with controller in hand). It is through Presence and Environment that the notion of treating games as a nested space was embedded into the diagram. As a nested space, games are entangled with an "external" reality which includes the person playing the game, all of them affecting and being affected by each other. As these entanglements grow perpetually outwards to encompass an overwhelming scope, this thesis has had to make artificial distinctions of the borders of a game in order to provide a sense of clarity. I have not, for example, discussed games such as *Pokémon Go* (Niantic, 2016), which uses geographic data of players to generate Pokémon in specific area (water types near rivers, lakes, and seas). The

release of the game also resulted in unintended consequences in the world, including teenagers who got stuck in a cave system (BBC News, 2016b), thieves using the 'lure' mechanic to attract victims (Favis, 2016), and players accidentally illegally crossing the border between the Canada and the US (Reuters, 2016). Instead, this thesis has traced the spatial entanglements that ultimately highlight the relations between games and the environment. Player Presence in this case, positions people as environmental actants, both bringing their Contextual Space of being already entangled in the climate crisis to each game played whilst also affecting the climate crisis by playing a technology which requires resources to run, such as electricity and plastic. The player is not simply held inside a wider framing reality, but continually co-constructing and being co-constructed by it.

In addition, throughout the thesis Presence has been refined to include not simply the human player accessing the game but an amalgamation of human and non-human agencies which make a player's Presence in a game possible. It is in conversation with Contextual Space, specifically in chapter four, where Presence is shown to be reliant on the physical objects which facilitate the playing of a game such as controllers and consoles, as well as electricity and the player's entanglements external to the game itself (both human and non-human). As such, players cannot be isolated as singular entities who interact with games. While Presence, as I define it, remains the spaces which players inhabit during play, this definition is contingent, and works to provide an anchor point from which I interrogate the notion that players and games interact as isolated entities, a position I develop to argue that players and games comprise an entanglement of agencies. By keeping Presence as focused on the player but steadily widening the focus to include the non-human, this thesis looks to expand the category of human player to recognise the entanglements of non-human and human which produce a player. Miguel Sicart arrives at a similar definition of the transformative properties of applying Barad's work to games, for Sicart that is specifically with analogue games. Discussing the oldest analogue game piece, the stick, he states 'when I become entangled with the stick by playing, its agency is part of what I become related with: what it allows me to do, how it lets itself be appropriated and how it appropriates me' (2023:24). The entanglement of human player and stick defines possible available actions and outcomes to play, as well as, I argue, create Presence for both the stick and the player. In digital games this can be the entanglement of player and controller, as I explored in chapter four, as well as player and procedurally

generated space, as I explored in chapter two. Each of these examples suggested the ways in which entanglements affect how a player's presence in a game emerges, and from there how play will unfold in the game's environment.

Contextual Space:

Contextual Space, as defined in chapter one, refers to the sets of entanglements that players are a part of in their ever-day reality. This includes their lived experiences, knowledge of narrative tropes, and their imbrication within wider phenomena such as the climate crisis. These entanglements are the relations which a player emerges from before interacting with a game, which the player then brings with them to interact with a game's space. These entanglements affect how space and narrative unfold during play. During the thesis I have deployed the concept of Contextual Space to navigate my own relationships within games and the climate crisis. Through the analysis of my own play, my understanding of Contextual Space has shifted from seeing it as a way of extracting or generating meaning from a text to regarding it as a vital part of the process of becoming of player, game, space, and narrative. This is a process which is occurring constantly both outside of, and during, play. Contextual Space does not act to uncover meaning found innately within games, but instead is part of the entanglements from which meaning continually emerges. Games emerge through the relations that these entanglements, which are inherent in a player's external reality, produce. Digital games, such as *Death Stranding*, emerge in conversation with environmental issues because they are produced and played within a world where the current and upcoming predicted consequences of the climate crisis make up the Contextual Space of its player's external reality. My own experiences on the Norfolk coast, detailed in chapter four, where buried deposits of oil are periodically uncovered disrupting the landscape due to the consequences of the climate crisis, affected how I experienced *Death Stranding* and its oil-soaked imagery. Contextual Space offers a way of thinking through player interactions with games as not purely within the non-humans at the site of play (controllers, AI, electricity), but instead as part of a much wider set of entangled agencies which are vital in producing the becoming of the world such as the climate crisis.

Narrative Generation:

In the original diagram, Narrative Generation is infused within the coming together of

Presence, Contextual Space, Environment, and Play. I describe Narrative Generation as 'infused within' to reflect the inclusion of narrative in every part of the performance of game space. Rather than the culmination of the aspects of the diagram, Narrative Generation is threaded through each aspect of game space, appearing in each as a key element of how the aspects interact. I initially defined Narrative generation in terms that were close to what Michael Nitsche describes as the 'fictional plane' in his own diagram of game space. Shown below in fig.22, Nitsche's analytical planes are divided into rule-based, mediated, fictional, play, and social, with fictional being the story being told within the player's mind.

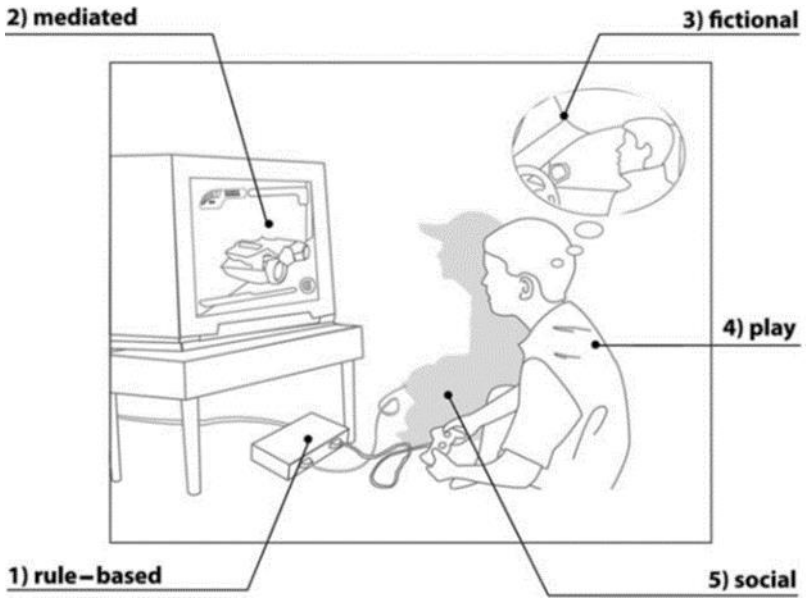

Fig 22: Nitsche's Five Analytical Planes taken from his book *Video Game Spaces* (2008).

By using the fictional plane as a key coordinate for my own concept of narrative generation, I positioned stories as being created by players. In the original diagram I located narrative generation in the minds of the two players; this emphasis on the human replicates Nitsche's theorisation of narrative in digital games as that which 'lives in the imagination, in other words, the space "imagined" by players from their comprehension of the available images' (2008:16).

However, as this thesis has progressed, narrative generation has steadily been externalized, and my analysis has relocated it from within the minds of players to intra-story spaces and external world spaces. For example, in chapter two, I examined the effect of procedurally generated spaces on the production of *The Binding of Isaac: Afterbirth +*'s Gothic narrative.

The story of an endless uncovering required the input of the algorithm to be performed. As such the game's narrative does not simply occur within the mind of the player but is enacted with non-human co-constructors. Narratives emerge through the meeting of aspects beyond simply that of the human, including the environment of a game's external reality, and the internal programming which governs game space and NPCs. By moving the production of narrative beyond the human mind, this relocation acts as a culmination of chapter one's assertion that narratives are spatial, and spaces are storied. As while players are key elements in the production of narrative, they are co-constructors alongside non-human aspects such as space and AI. It is only in tandem with the non-human that narratives can be generated.

Play:

I began the thesis by defining play as the moment-to-moment gameplay inherent in digital games. These are the moments that the player presses a button on a controller to produce an action within the game which then has an effect on the game space. As the thesis has progressed, Play has come to be defined as an activity not confined to a human player but as an iterative process continually occurring and congealing through the interaction of multiple agencies. In chapter two, the algorithm structuring the space in *The Binding of Isaac: Afterbirth +* was vital in the process of play. Without the inclusion of the AI, playing the game would unfold very differently, as the space would not be refreshed each playthrough. While the player is vital for play to occur, playing is a collaborative act of playing with something, as such the agency of the non-human elements of a game are required to structure what play produces. To return to Miguel Sicart, in his article 'Playthings' (2021), he defines play as a 'relational material practice', a process from which new objects emerge. By defining play as relational, Sicart sites play not in the individual but in the relations between humans and non-humans. He states that 'the stick is not a toy, or a game: it is a thing I am playing with, and that plays with me', play emerges from the interaction between both elements, the player and the stick (2021:9). I draw on Sicart's ideas here to argue that, instead of being constrained as the actions of a player on a controller in the external world and their subsequent interactions within the intra-story world, play is expanded to be the act of performing a game. By performing a game I mean the interaction of agencies which produce a game as it is played, both of the human player and the non-human aspects such as a controller, code, electricity. This thesis has refined its understanding of play to be considered as a process, a performance of space and narrative.

As such it is not only the human player who is playing, it is also the non-human agencies entangled within the game which are involved in the process of 'play' which produces game space. Whether that is the consideration of NPCs (both spatial and otherwise) or the agentive power of plastic in the unfolding of the performance of a game space, Play is therefore understood as inclusive of all the agencies which affect the emergence of the game in the moment-to-moment of gameplay.

The change between my initial definition of play and this one reflects the changes seen in the other aspects of the diagram. A collective movement away from considering the aspects as human-centric which happen to engage with the non-human, to a recognition of the aspects as built from the entangled agencies both human and non-human. The addition of Barad's theories of agency and entanglement have resulted in the refining of the aspects not as an equation of Human + Non-human = Game Space but instead, reflecting Barad's melding of agencies through language, Game Space = Human/Non-human. The category of human or anything considered human-produced (Narrative, Play, and Space) when interrogated reveals itself as processes made up of an entanglement of agencies. We are always in the process of acting-with, or rather, playing-with the world, and as such cannot be untangled from the non-human.

Gothic and the Environment:

The situation of the original diagram of the five aspects of digital game space and narrative alongside this final version reflects the development of my argument during the process of researching this thesis. As I traced the entanglements from which game and player emerge, I found myself moving outwards from an initial interaction to encompass wider phenomena. Starting from the interactions happening during a play session, the act of playing a game, to uncovering the journey the plastic in controllers have taken and will take after they no longer aid in playing games. I found myself as a researcher pulled increasingly towards the ways the environment, and specifically the climate crisis, are entangled with games, and what that means for the production of game space and narrative. Throughout the writing the climate crisis has had measurable effects on places to which I have a personal attachment. Since writing the fourth chapter of this thesis which involved an autobiographical discussion of growing up on the Norfolk coast, further erosion in March 2023 has led to three houses being demolished

preemptively and a road has fallen into the sea in the village where I grew up (BBC News, 2023). This erosion, caused in part by rising sea levels which are directly affected by the climate crisis, is an example of environmental impact of anthropogenic climate change happening here in the UK. In the UK, of course, these effects are measurable but manageable. Other examples, in places where weather fluctuations are more extreme, are resulting in threats to life, the displacement of people, and devastating environmental collapse. Current literature states that there must be 'rapid, deep, and in most cases immediate greenhouse gas emission reductions' to limit near term warming between 1.5 and 2 degrees, an action which would mitigate some of the worst effects of the climate crisis (IPCC, 2023). These immediate and radical changes will be required within every facet of human interaction, including games. This is due to games being a part of the environment and contributing directly to climate change through carbon emissions in production, shipping, retailing, use, and disposal; game space, as I have argued throughout this thesis is not a separate entity unaffected by the continuing becoming of the world, it is affecting and affected by that process of becoming. Taking a new materialist perspective on the climate crisis Blanche Verlie states that 'because we are always acting-with the world, we cannot fully predetermine or limit what those actions should or will be and so we must be open to creating unanticipated, different climate actions (diffr-actions) *with* the world' (2020:4 emphasis in original). By considering humans as always in the process of acting-with the world, playing games becomes one of the ways the climate crisis emerges from human and non-human interactions. As such research which interrogates the intersection between digital games and the environment is vital for understanding an aspect of how we as humans act-with the world to produce the current climate crisis.

Discussing games through an ecological perspective has been a relatively recent phenomenon - arising in the work of academics such as Alenda Y. Chang and Benjamin Abraham. Chang's *Playing Nature* (2019), focuses on how game developers use visuals and interactions to present environments to their players, and how games can be used to give players a space to explore ecological consequences. Games in this theoretical framework help to situate how the environment is currently envisioned, as well as being a tool for manipulating how players think through their relationship with the environment. Meanwhile Abraham writes in *Digital Games after Climate Change* on the material components which are necessary for games to exist, including detailing the carbon footprint of a single physical game being made

and shipped to Australia. Abraham estimates the global annual carbon emissions of the games industry to be in the range of '3–15 million tonnes of CO2 equivalent emissions per annum', which, he continues, places the development of games as taking up 0.04% of 34 billion tonnes of CO2 the 2020 Global Carbon Budget (2022:116–7). In discussing games as a tool for change, Abraham argues that 'What we need is to change the world itself […] That is where we need to act. If we can change the emissions footprint of the games industry itself, […] we have made a better world regardless.' (2022:55). For Abraham, whether games can be a persuasive tool to convince players to change behaviors towards the environment is less important compared to making material changes to how games are made.

While I agree with Abraham that changing the behaviours of the gaming industry is vital for the health of the climate and the environment, studying the product of said industry helps in understanding how narratives of human and non-human interactions are shaped by those behaviours. Narratives emerging from a medium 'premised on globe-spanning resource extraction and waste' are impacted by these material conditions (2019:173). While many players do not necessarily know (or perhaps even care) about the non-humans encountered in this thesis, for example in not knowing the intricacies of the journey the plastic of their controllers have taken and will continue to take long after its use as a gaming object has passed, the non-human is still an agentive figure in the becoming of a game's space and narrative. Whether this surfaces when a controller fails during a play session, thereby confronting the player with their presence as an object which had previously been taken for granted, or in how its creation contributes to the continual warming of the planet, the controller has an effect on the emergence of the game. Human understanding or interest is not required for non-human agency to affect the becoming of the world, even in the "human-centric" medium of games.

My thesis examines games as narrative objects, that, when played, engage the player with the non-human. By playing games, players directly interact with the agency of, among others, plastic and artificial intelligence, as well as wider phenomena such as the climate crisis. We are, to use Blanche Verlie's terminology, acting-with the world. It is through this interaction that game space and narrative emerge, from the entanglements of human and non-human matter. By making changes to both the material reality games are produced within as well as the intra-story world of games, the engagement with the agentive non-human will occur differently both

during and outside of a play session, resulting in new emergence of game narratives and spaces. This thesis does not look to offer methods to enact that change Abraham and Chang have both engaged in presenting ways that change could happen or examples where an alternative approach to game development has occurred. Instead, this theoretical framework for writing on the environment and games looks to recognise the importance of the non-human in a medium which has been considered human orientated in terms of game development and game play. This framework looks to build on Chang's work of breaking down the boundaries between the natural and the virtual as well as the ecological and the literary in an effort to break down the division between the ecological as centred around the non-human and games as human-centric performances. While in the vast majority of cases the human is still vital for games to exist, by recognising the non-human in players' engagements with games, I present digital games as spaces where entanglements of multiple agencies can surface within the limited scope of its nested space as easier to identify becomings, such as a game's narrative.

During this expansion of scope to encompass the relations between games and the environment, the Gothic has acted as a through line which unites the intra-story world of the game and the player's external reality. The Gothic permeates our interactions with environment in crisis, whether that be within the boundaries of fiction or beyond. The term ecoGothic itself, becoming a subgenre of the Gothic in which interactions between humans and non-human nature erupt in ways which inspire terror and/or horror. In defining the ecoGothic, Andrew Smith and William Hughes say that 'Nature becomes constituted in the Gothic as space of crisis which conceptually creates a point of contact with the ecological' (2013:3). For Smith and Hughes, the ecoGothic is inherently spatial, a 'space of crisis' which renders anxieties about the ecological in the landscape as well as its non-human inhabitants. These anxieties often unfold in ways which are ecophobic, meaning that they present a fearful outlook on nature. Specifically ecophobia is defined by Simon Estok as the 'contempt and fear we feel for the agency of the natural environment' (2009:207). Estok argues that ecophobia does not necessarily equal the ecoGothic, one does not mean the inclusion of the other, the ecoGothic is not always ecophobic, and ecophobic images are not always gothic. However, ecophobia is a useful theoretical lens in which to understand our engagement with the climate crisis through digital games created in the Gothic mode. That the Gothic can be used to

interrogate the ongoing climate crisis has credence in current academic writings in the field. In the 2022 introduction to *Dark scenes from damaged earth: the Gothic Anthropocene* Johan Anders Höglund, Justin D. Edwards, and Rune Graulund situate the Gothic as 'a supremely suitable chronicler of the violence of climate change' due to the genre's interest in 'transgression, excess, and monstrosity' (2022:XI). The Gothic can assist in the creation of narratives which recognise and amplify the consequences of our effects on the environment. This thesis has argued that the Gothic's ability to uncannily shift perceived agency results in the creation of spaces and narratives which undermine human primacy; instead, presenting an entanglement of human and non-human agencies. To achieve this defamiliarization, I have interrogated the term uncanny, defined here as a process of seeing the familiar (human agency) within the unfamiliar found often in the non-human envisioned as human (dolls, wax figures). The uncanny allows for agency to change from being innately held within human characters, to flowing within non-human entities. Amitav Gosh in *The Great Derangement* argues that the term uncanny best fits our experience of the climate crisis, he argues that the uncanniness of our interaction with the environment 'lies precisely in the fact that in these encounters we recognize something we had turned away from: that is to say, the presence and proximity of non-human interlocutors' (2016:30). The non-human becomes a force of confrontation, making themselves known through the environment. However, to break the uncanny's human-centered depiction I shifted to the Weird, a genre which Jonathan Newell states is 'a tumour of sorts growing out of the gothic – composed of the same tissue but unfamiliar, alien and yet not-entirely-so, at once part of its progenitor and curiously foreign to it' (2020:4). The Weird offers a movement away from the familiar, refusing to present human shaped no-humans. According to Chloé Germaine, the Weird offers 'a puncturing of the anthropocentric bias of the Freudian uncanny, and a corrective to its prohibition against recognising agency in anything other than human' (2023:136). Taking these ideas forward, I argue that the Gothic's suitability for producing narratives on the climate crisis, comes not only from this interest in 'transgression, excess, and monstrosity' but from its use of the uncanny to recognise the agency in sites other than the human.

In addition to being a 'supremely suitable chronicler', the Gothic allows conversation about the climate crisis where realist fiction is unable (Höglund et al., 2022:XI). In his writing on the presentation of the events of global warming in literature Amitav Ghosh writes that realist

fiction is a 'concealment of the real', an act of making improbable events believable for a reader. When an author steps outside the realm of believability, they 'court eviction from the mansion in which serious fiction has long been in residence'; instead, falling into the realms of genre fiction, which he groups into 'the Gothic, the romance, and the melodrama' as well their "newer" forms the previous have morphed into: namely 'Science Fiction, Fantasy, and Horror' (2016:24). While I would argue that the Gothic has not morphed into any of these forms and instead is a mode which can exist both as itself and as part of other genres, I agree that the Gothic operates as a way of writing stories which does not rely on maintaining a particular notion of believability. The Gothic, as defined in this thesis, is an inherently spatial mode of narrative creation which recognizes and amplifies the agentive power of the non-human beyond the realms of realism. It is the mode's lack of required believability which allows Gothic games to engage with spatial improbabilities such as procedurally generated spaces, spaces as agentive characters, and uncanny futuristic landscapes without remnants of plastics, as has been explored in this thesis. They also, as Ghosh argues, make genre fiction a prime location for interrogating the climate crisis. The climate crisis is part of these improbable events as 'the complacency and confidence of the emergent bourgeois order' feeds a notion that a change to the climate which will alter the reliability of that order is unlikely (2016:21). Especially as a thesis written in the UK, part of the Global North, where the effects of the climate crisis are not as readily apparent, the crisis is not necessarily a part of the everyday. Its effects on humans when documented are part of news reports in further away locations or the subject of genre fiction such as the ecoGothic.

While Science-Fiction, Ghosh argues, is a well-documented way of writing about the environment, whether that be on Earth or the issues transposed to alien planets, this thesis has shown that the Gothic mode can engage with environmental issues in a way that recognises the agency of the non-human. Ghosh himself uses Gothic imagery when he states that the events of the era of global warming 'are in many ways uncanny; and they have indeed opened a doorway into what we might call a "spirit world" – a universe animated by non-human voices' (2016:73). The consequences of the climate crisis interrupt a preconceived notion of a stable, passive world, unveiling an alternative where the non-human is an active and responsive participant. As I stated in the introduction of this thesis, the Gothic, is not only a fearful inheritance in time and a claustrophobic sense of space as defined by Chris Baldick

(2009:xix), thereby linking space and story, but also an uncanny shift in perceived agency. The Gothic allows for the agency of non-humans to surface as an easily visible entanglement, their ability to affect the becoming of the world including its narratives and spaces although amplified within fiction reflects real entanglements in the external reality.

As the Gothic is a mode where the non-human is viewed as an agentive aspect of the world as it is becoming, there is a danger for Gothic media to reinforce narratives of man versus nature. This can be seen in texts such as *Death Stranding*, which make use of ecophobic imagery which has the effect of positioning the non-human as antagonistic. The Gothic can open discussions on environmental issues and the role of the non-human. This is not to say that it is a mode which produces perfect behaviour to be copied or is unaffected by our own biases in our external reality. However, it provides a space for conversations which challenge notions of human centrality, primacy, and legacy. It is digital games' position as a nested space that is entangled with the external world, which this thesis has traced as happening through the player but also the non-human components such as plastic which are vital to the playing of games, that connects games' Gothicised spaces and the immediate reality of the climate crisis.

Looking beyond games: The magic circle

The connection between the intra-story world of games and the external reality of the player, can be best exemplified through the concept of the magic circle. I introduced the magic circle in the introduction as a way of presenting the overlap between my theoretical coordinates: spatial theory, game studies, the Gothic, and new materialisms. As a final point I would like to return to the metaphor of the magic circle in order to demonstrate how the findings of this thesis can apply beyond the spaces inhabited by games.

The magic circle details an understanding of the interactions between the human player and the non-humans which constitute a game as transformative. By stepping into the magic circle (either physically or imaginatively) both the human and the non-human undergo a continual process of production from which they emerge as player and game. This process includes a modification of meaning, for example, lipstick is an item which increases the range of the player's tears in *The Binding of Isaac*, while the player becomes entangled with the

character of Isaac who is being enhanced through the lipstick item. Matter takes on new associations when the player chooses to step into the magic circle and play a game. This is also visible outside of intra-story narrative objects. A controller takes on alternative meanings through the types of verbs players are asked to enact through its use. A way of navigating post-apocalyptic America in *Death Stranding* becomes the infrastructure required to attack Father Gascoigne in *Bloodborne*. The magic circle transforms that which is inside it, both in the intra-story space of the game and the external reality of the player.

In addition, there is an alteration in the congealing of agency as the magic circle acts as an agential cut, by redistributing agency to both human and non-human elements. While this thesis has argued that the non-human is always agentive, the transformative quality of the magic circle emphasises the distribution of agency through all matter. What imagining games through the magic circle achieves is providing a space where agency can be observed, much like how a science experiment from quantum physics can present a space where light is shown to be both a wave and a particle. The effects are always happening, light is always a wave and a particle – what is different to the everyday is the implementation of methods utilised to demonstrate the observation. We can see this also in games, the agency of non-humans is uncovered because of the unique situation games present for interactions between player and game. This thesis argues that the types of interaction seen between humans and non-humans in games, both collaborative and co-constitutive, demonstrates a potential model in which the affective nature of these interactions could be continued external to games. Efforts to reframe the relationship beyond games to match the playful interactions uncovered within games, has the potential for alternative outputs in contexts where there is currently friction. For example, in the realms of the climate crisis, where the relationship between humans and non-humans is often viewed as antagonistic; drawing on the playful interactions demonstrated as possible through games may produce new ways of engaging with the environment.

In addition to relations to the environment, this thesis has implications to how we engage with artificial intelligence technology as it continues to advance. Throughout the writing of this thesis new AI products such as ChatGPT and Dall-e have come to market. As I complete this conclusion OpenAI's newest creation, SORA, has been announced; a text-to-video model which takes written prompts and generates one-minute-long videos. The videos, which have been

curated by OpenAI and as such are examples of the very best that the model can create, are extremely realistic. Its introduction into the market will have large implications on conversations surrounding human creativity and the ethical use of AI in the media. While the direction of discussion on the topic as well as advances in technology are not necessarily possible to predict, the relationship between humans and the non-human matter which constitute AI will be at the centre of any debates. This thesis' arguments, which engages with AI as a non-human element able to co-constitute space and narrative, can be expanded beyond game space to recommend play as a mode of engagement that can influence the outputs of our interactions with AI. As a result, while a playful engagement with AI will not solve the ethical issues of its use, approaching the problem in a way which recognises the agency of the non-human and its potential to affect the generation of narratives and spaces (both in digital and non-digital environments), allows for a larger variation of outcomes. An output we need to strive for in order to provide answers to the ethical questions AI raises.

As this thesis looks towards a future which includes unpredictable technology (both in what any future tech will do, and how it will affect the world) as well as an ongoing climate crisis which demands our attention and impels our engagement with the world, what emerges is the importance of our relations with the non-human aspects which are involved in the becoming of the world. Games are perhaps uniquely suited for the interrogation of our relations with the non-human, as the choice to play a game is a choice to engage with the non-human. Patterning our engagement with these present and future challenges around the deliberate and intentional interactions found in the choosing to play-with the non-human to generate space and narrative, may lead to a process which more easily recognises the agency of the non-humans which comprise the very becoming of the world.

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