Ambiguous Worlds
Understanding the Design of First-Person Walker Games

A thesis submitted in fulfilment of the requirements for the degree of Doctor of Philosophy

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Declaration

I certify that except where due acknowledgement has been made, the work is that of the author alone; the work has not been submitted previously, in whole or in part, to qualify for any other academic award; the content of the thesis is the result of work which has been carried out since the official commencement date of the approved research program; any editorial work, paid or unpaid, carried out by a third party is acknowledged; and, ethics procedures and guidelines have been followed.

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Contents

List of Figures ......................................................................................................................... 9
List of Tables .......................................................................................................................... 15
Abstract .................................................................................................................................. 17
Chapter 1: Introduction ........................................................................................................... 19
  1.0 Description of Project ........................................................................................................ 19
  1.1 Background ........................................................................................................................ 21
  1.2 Approach ........................................................................................................................... 24
  1.3 Limitations ........................................................................................................................ 26
  1.4 Contribution ...................................................................................................................... 27
  1.5 Thesis Structure ................................................................................................................ 28
Chapter 2: Framing the Walker ............................................................................................... 32
  2.0 Overview ........................................................................................................................... 32
  2.1 Dear Esther, the Seminal Walker ..................................................................................... 34
    2.1.1 Dear Esther: Game Experience ............................................................................... 34
    2.1.2 Dear Esther: Development Background ................................................................ 35
    2.1.3 Dear Esther: Design Attributes ............................................................................. 36
    2.1.4 Dear Esther: Commercial Re-release and Popular Reaction ..................................... 42
  2.2 Chronological Precursors to the Walker ........................................................................ 45
    2.2.1 Counter-Cultural Art Mods ...................................................................................... 46
    2.2.2 Non-Violent Spatial Exploration Mods ................................................................. 49
    2.2.3 First-Person Environmental Narratives ................................................................. 51
    2.2.4 Mechanically Minimal Indie Notgames .................................................................. 53
  2.3 Current Walkers ................................................................................................................ 56
    2.3.1 Key Walker Games: 2012–2013 ............................................................................ 57
    2.3.2 Issues Surrounding the Walker .............................................................................. 64
    2.3.3 Walker Developments: 2014–2018 ....................................................................... 73
  2.4 Conclusion ......................................................................................................................... 79
Chapter 3: Walker Analysis ..................................................................................................... 82
  3.0 Overview ........................................................................................................................... 82
  3.1 Study Approach .................................................................................................................. 83
  3.2 Common Themes .............................................................................................................. 91
    3.2.1 Theme 1: Player Interactivity ................................................................................... 91
    3.2.2 Theme 2: Temporal Space ...................................................................................... 107
    3.2.3 Theme 3: Player Focus ........................................................................................... 120
    3.2.4 Theme 4: Ambiguity ............................................................................................... 130
  3.3 Discussion of Findings: Understanding Ambiguity within Game Design ....................... 154
    3.3.1 Interrogating Ambiguity in Walkers ...................................................................... 154
    3.3.2 Understanding Walkers as Played and Gamed ...................................................... 159
    3.3.3 Curiosity and Game Design .................................................................................... 164
  3.4 Conclusion ........................................................................................................................ 169
  3.5 Epilogue: Findings in Contemporary Context .................................................................. 171
Chapter 4: Design Project, WORLD4 .................................................................................... 189
  4.0 Overview ........................................................................................................................... 189
List of Figures

Figure 1: Screenshot, WORLD4. ........................................................................................................20
Figure 2: Screenshot, Dear Esther (2008). ......................................................................................35
Figure 3: Screenshot, Dear Esther (2012). .......................................................................................43
Figure 4: Screenshot, Dear Esther (2012). .......................................................................................92
Figure 5: Screenshot, Gone Home (2013). .......................................................................................94
Figure 6: Screenshot, The Stanley Parable (2013). .........................................................................96
Figure 7: Screenshot, Gone Home (2013). .......................................................................................97
Figure 8: Screenshot, Proteus (2013). .............................................................................................98
Figure 9: Screenshot, Dear Esther (2012). ......................................................................................101
Figure 10: Screenshot, Proteus (2013) (Newill 2013). .................................................................102
Figure 11: Screenshot, Gone Home (2013). ...................................................................................104
Figure 12: Screenshot, The Stanley Parable (2013) ......................................................................105
Figure 13: Screenshot, Gone Home (2013). ...................................................................................108
Figure 14: Screenshot, Dear Esther (2012). ..................................................................................110
Figure 15: Screenshot, Gone Home (2013). ..................................................................................111
Figure 16: Screenshot, The Stanley Parable (2013) ......................................................................112
Figure 17: Screenshot, Gone Home (2013). ..................................................................................115
Figure 18: Screenshot, Dear Esther (2012). ..................................................................................116
Figure 19: Screenshot, The Stanley Parable (2013) ......................................................................117
Figure 20: Screenshot, Proteus (2013). ..........................................................................................118
Figure 21: Screenshot, Gone Home (2013). ..................................................................................121
Figure 22: Screenshot, Half-Life 2 (2004). .....................................................................................122
Figure 23: Screenshot, Proteus (2013). ..........................................................................................123
Figure 24: Screenshot, Dear Esther (2012). ..................................................................................124
Figure 25: Screenshot, Proteus (2013) (Pedercini 2017) ........................................... 125
Figure 26: Screenshot, Gone Home (2013). ............................................................. 126
Figure 27: Screenshot, Dear Esther (2012). ............................................................. 127
Figure 28: Screenshot, The Stanley Parable (2013) .................................................. 128
Figure 29: Screenshot, Gone Home (2013). ............................................................. 129
Figure 30: Screenshot, Gone Home (2013). ............................................................. 135
Figure 31: Screenshot, Dear Esther (2012). ............................................................. 136
Figure 32: Screenshot, The Stanley Parable (2013) .................................................. 137
Figure 33: Screenshot, Dear Esther (2012). ............................................................. 139
Figure 34: Screenshot, Gone Home (2013). ............................................................. 142
Figure 35: Screenshot, Dear Esther (2012). ............................................................. 143
Figure 36: Screenshot, The Stanley Parable (2013) .................................................. 144
Figure 37: Screenshot, Proteus (2013). ................................................................. 145
Figure 38: Screenshot, Gone Home (2013). ............................................................. 148
Figure 39: Screenshot, Dear Esther (2012). ............................................................. 149
Figure 40: Screenshot, Dear Esther (2012). ............................................................. 150
Figure 41: Screenshot, These Monsters (2016) (Strangethink 2016). ..................... 173
Figure 42: Screenshot, Fugue in Void (2018) (Bell 2018). ....................................... 174
Figure 43: Screenshot, Bernband (2014). (Tom 2014a) ........................................... 175
Figure 44: Screenshot, CHYRZA (2014). (Horrorshow 2014) ................................. 176
Figure 45: Screenshot, Everybody's Gone to the Rapture (2015). (Kohler 2016) ... 180
Figure 46: Screenshot, Tacoma (2017) (Fullbright 2017). ..................................... 181
Figure 47: Screenshot, SOMA (2015) (Frictional Games 2015) .............................. 184
Figure 48: Screenshot, WORLD4. .......................................................................... 193
Figure 49: Screenshot, WORLD4. .......................................................................... 198
Figure 50: Screenshot, WORLD4 original prototype ............................................. 202
Figure 51: Photograph, WORLD4 multi-screen prototype. Playtesting session 2 … 206
Figure 52: Photograph, WORLD4 multi-screen prototype. Playtesting session 3 … 207
Figure 53: Screenshot, WORLD4. Mosaic camera prototype ................................ 208
Figure 54: Screenshot, WORLD4. Project in the Unity editor ................................ 212
Figure 55: Screenshot, WORLD4 ................................................................. 214
Figure 56: Screenshot, WORLD4 ................................................................. 215
Figure 57: Screenshot, WORLD4 original prototype ......................................... 216
Figure 58: Screenshot, WORLD4 ................................................................. 217
Figure 59: Screenshot, WORLD4 ................................................................. 219
Figure 60: Screenshot, WORLD4. Early prototype ......................................... 222
Figure 61: Screenshot, WORLD4 ................................................................. 224
Figure 62: Screenshot, WORLD4 ................................................................. 226
Figure 63: Screenshot, WORLD4 ................................................................. 227
Figure 64: Screenshot, WORLD4 ................................................................. 228
Figure 65: Screenshot, WORLD4. Project in the Unity editor ......................... 232
Figure 66: Screenshot, WORLD4 ................................................................. 235
Figure 67: Screenshot, WORLD4 ................................................................. 237
Figure 68: Screenshot, WORLD4 ................................................................. 239
Figure 69: Screenshot, WORLD4 ................................................................. 240
Figure 70: Screenshot, WORLD4 ................................................................. 242
Figure 71: Screenshot, WORLD4 ................................................................. 245
Figure 72: Screenshot, WORLD4 ................................................................. 246
Figure 73: Screenshot, WORLD4 ................................................................. 249
Figure 74: Screenshot, data analysis spreadsheet, video, Board Game Design Day: The Making of ‘Pandemic Legacy’, GDC Vault, accessed 2017 .......................... 270
Figure 75: Screenshot, web browser ................................................................. 280
Figure 76: Photograph, whiteboard mapping final stage ................................ 285
Figure 77: Screenshot, WORLD4 ................................................................. 298
Figure 78: Screenshot, WORLD4 ................................................................. 300
Figure 79: Screenshot, WORLD4 ................................................................. 304
Figure 80: Screenshot, WORLD4 ................................................................. 306
Figure 81: Screenshot, WORLD4 ................................................................. 311
Figure 82: Screenshot, WORLD4 ................................................................. 318
Figure 83: Screenshot, WORLD4 ................................................................. 322
Figure 84: Screenshot, WORLD4 ................................................................. 323
Figure 85: Screenshot, WORLD4 ................................................................. 339
Figure 86: Screenshot, The Legend of Zelda: Ocarina of Time (1998) (Jegged d.) 343
Figure 87: Screenshot, Deus Ex: Mankind Divided (2016) (Gamepur 2016) .... 344
Figure 88: Screenshot, Dishonored (2012) (Boyle Party, Dishonored n.d.) .... 345
Figure 89: Screenshot, Dishonored 2 (2016) (Burford 2017) ...................... 346
Figure 90: Screenshot, Fatal Frame (2001) (Fatal Frame Xbox Viewfinder, Fatal Frame n.d.) ................................................................. 347
Figure 91: Screenshot, WORLD4 ................................................................. 348
Figure 93: Screenshot, The Legend of Zelda: Breath of the Wild (2017) (Hamilton 2017) ................................................................................. 351
Figure 94: Screenshot, Shadow of the Colossus (2005) (b081 2007) .......... 353
Figure 95: Screenshot, WORLD4 ................................................................. 354
Figure 96: Screenshot, Dear Esther (2012). ................................................................. 356
Figure 97: Screenshot, Bernband (2014) (Tom 2014b). .................................................. 357
Figure 98: Screenshot, Antichamber (2013) (The Educational Games Database 2014).
........................................................................................................................................ 357
Figure 99: Screenshot, Korsakovia (2009) (Goodwin 2012). ........................................... 358
Figure 100: Screenshot, Dishonored 2 (2016) (Carrier 2017). ....................................... 359
Figure 101: Screenshot, Catacombs of Solaris (2016) (MacLarty 2017). ....................... 360
Figure 102: Screenshot, WORLD4. .................................................................................. 361
Figure 103: Screenshot, Gone Home (2013). ................................................................... 363
Figure 104: Screenshot, Dear Esther (2012). ................................................................... 364
Figure 105: Screenshot, Hellblade: Senua’s Sacrifice (2017) (JJBYACH 2017). ............. 365
Figure 106: Screenshot, WORLD4. .................................................................................. 367
Figure 107: Screenshot, Dear Esther (2012). ................................................................... 368
Figure 108: Screenshot, Half-Life 2 (2004). .................................................................... 369
Figure 109: Screenshot, Dark Souls (2011) (Halloran 2015). ........................................... 370
Figure 110: Screenshot, Dear Esther (2012). ................................................................... 371
Figure 111: Screenshot, WORLD4. .................................................................................. 373
Figure 112: Image (Regular versus mimic chest n. 2018). ............................................. 374
Figure 113: Screenshot, Layers of Fear (2016) (Bloober Team SA 2016). ....................... 376
Figure 114: Screenshot, WORLD4. .................................................................................. 384
Figure 115: Screenshot, WORLD4. .................................................................................. 386
List of Tables

Table 1. Consolidated findings, walker design themes........................................153
Table 2. Consolidated findings, WORLD4 design features. .....................................254
Table 3. Consolidated findings, table of WORLD4 player experience themes.......337
Table 4. Consolidated findings, design strategies. .................................................378
Abstract

The ‘walker’ is a burgeoning form of videogame with a growing body of literature primarily discussing how the genre challenges the accepted norms of games. These discussions widely use the derogatory term ‘walking simulator’, which implies its non-game status. What is also clear from these discussions is how these games draw on, but also push back against game design conventions. Walking is the primary means of interaction in walker games, rather than prioritising ‘skill-based’ mechanics. For example, the mechanics of gameplay in walker games are typically minimal, slow and non-violent.

The unique design focus of walker games exists within a contested and complicated area of game design literature, yet many players find the exploration and experiences of these game environments to be compelling. This research asks: What gameplay experiences do walkers elicit, and how might designers understand these experiences? What are the game design attributes that engage players to explore 3D walker environments? How can these design attributes be used to design first-person walker games and 3D games more broadly?

Drawing upon game design and design research literature, I explore these questions with specific focus on player interaction and level design in walker game world exploration. My research approach consists of three major investigative stages. I conduct a formal analysis of four existing walker games: *Dear Esther*, *Proteus*, *Gone Home* and *The Stanley Parable*. My analysis reveals four key themes for investigating walker design. These four themes are then applied to the development of my design project, *WORLD4*, a multi-view exploration game where players explore a 3D layered abstract world. I develop a methodological approach based upon indie gameplay
testing to conduct an analysis of WORLD4’s design through a two-stage qualitative player study.

Based on these three stages of analysis, I conclude that a particular kind of experience of curiosity emerges, driving player exploration in walker games. My findings indicate that the experience of curiosity is fostered by incorporating ambiguity into the game design, which modifies game world exploration into a more investigative and interpretive activity. I support this conclusion through three design themes to understand the player experience of WORLD4 and six design strategies for fostering ambiguity in the design of exploratory game environments. More generally, I contribute a perspective on game design that emphasises ambiguity in order to create heightened and compelling exploration experiences.
Chapter 1: Introduction

For a long time, I have been interested in what is popularly known as the “walking simulator” game genre. I remember my excitement playing ‘walker’ games for the first-time and trying to piece together their experience, one of mystery, confusion, and uncertainty. That experience left a strong impression on me; how could something feel so familiar and yet so radically different to other games? Over time I watched the walker grow beyond its roots into a popular, loose genre as the games landscape underwent cultural shifts. And yet despite these shifts the walker continues to provoke discussion and elude being pigeonholed. I have remained fascinated as to why myself and many others are still drawn to walker games and find their experiences so compelling, in light of historic and ongoing developments in the genre. My long-standing interest has motivated this research, through which, lead me to design my own game that presents an experience of heightened exploration.

1.0 Description of Project

My project, WORLD4, is a multi-dimensional first-person exploration game that I have designed to explore how ambiguity supports exploratory gameplay experiences in virtual environments.

As shown in Figure 1, WORLD4 is comprised of four viewports on a single screen. Each viewport features a separate first-person view; each provides a partial view of an exploratory 3D environment. In WORLD4 players explore four mysterious and interconnected game worlds simultaneously. To play, players navigate through a series of visually abstract corridors and chambers while negotiating differences between the four viewports. In doing so players reveal unusual hidden geometric sights. The overall design provides a reduction of explicit guidance, concealed
doorways, mysterious objects, and a lack of depth cues that disrupt onscreen spatial information and narrative readings, eliciting curiosity.

Specific to my project, I designed the 3D game environment, onscreen views, and player interactions to engage players in a spatially ambiguous exploration experience. I set up two player studies to investigate the design in-depth and constructed theoretical foundations that informed it.

My design enables me to test theories of spatial ambiguity within walker games and may enable game designers to foster ambiguity in their own 3D exploration environments. To achieve my aim, I investigate the genre of walker games, drawing upon theories and methods from the field of game design and broader design research.
1.1 Background

Within game research fields the walker has become a growing source of interest. For example, Bozdog & Galloway discuss the relationship between environment and narrative in walkers drawing upon literary studies and experimental theatre (Bozdog & Galloway 2016). Carbo-Mascarell utilises psychogeography to discuss the walker as a continuation and digitisation of walking as an aesthetic practice (Carbo-Mascarell 2016). Yet, much remains unclear as to what walkers tell us about game design. The walker is an important subject of interest for game designers and game researchers as it presents controversial and atypical approaches to what is conventionally considered a designed game. My research presents an understanding of walker design, that seeks to investigate two main issues around the walker: 1) challenging gameplay conventions; 2) limited critical design discussion around the genre.

The walker is a burgeoning form of game that entered popular discourse as an aesthetic movement in the 2012 – 2013 period. Although the walker eludes strict genre classification, it has been popularised by critically acclaimed titles such as Dear Esther (2012), winner of multiple major awards i.e. Independent Games Festival 2012. On the surface Dear Esther looked like a First-Person Shooter title Half-Life 2 (2004) using the same controls and underlying technologies, however, without shooting. Under the surface, walker titles share a likeness in their distinctly minimal gameplay characteristics, revealing distinct genre traits: an exploration of an atmospheric and solitary 3D space containing discoverable information imbued through environmental details, revealed through reduced movement interactions and a first-person perspective.
I acknowledge this definition assumes a particular construction of what the walker is, which is not necessarily correct. However, this genre definition is not reduced to taxonomical claims and is further substantiated through analysis that explicates the genre, including the social construction of the walking simulator.

An expanding body of literature in online blogs by journalists, critics, and game developers, and informal discussion among gamers, discuss the emergence of the walker game genre and how it challenges accepted game norms (Cross 2016; Irwin 2017; Kill Screen Staff 2016). Their discussions concern the widely adopted and attributed derogatory term ‘walking simulator’, which implies the non-game status of the walker. To call the walker a ‘genre’, ‘game’, or ‘designed’ is controversial as it eschews clear definitions.

The issue of challenging gameplay conventions is evident in popular controversy in gaming culture. The walker’s traits draw on but push back against conventions and values often considered essential to games by gamers, critics, and designers. Game studies theorist Ayse Gursoy discusses how the low interactive demands of walker game Dear Esther was the focus of much popular debate and backlash among players; an indicator of the walker as not being qualified as a ‘game’ and excluding it from game discussions (Gursoy 2013).

In discussions regarding gameplay conventions, theorist Brendon Keogh notes walkers feature explicitly minimal use of game mechanics as compared to other first-person game genres (Keogh 2015). The mechanics of gameplay in walker games are typically reduced, slow, and non-violent. Walking is the primary means of interaction, and popular game design conventions such as challenges, puzzles, fail-states, and goal-based structures are diminished or absent. The walker presents a re-prioritisation
of established game conventions for alternative experiences. Game journalist Katherine Cross and theorist Miguel Sicart describe these experiences as exploratory, interpretive, and self-reflective (Cross 2015; Sicart 2014).

The issue of limited critical design discussion is evident within foundational game design literature and theories. Typically, game design literature places focus and emphasis on rule-based design, prioritisation of mechanistic complexity or elegance, and quantified outcomes (Salen & Zimmerman 2004; Schell 2008; Koster 2004). As I will argue in this dissertation these do little to explain the characteristics or experiences of the walker within a game design context. Critic and designer Lana Polansky discusses how popular design theories ostracise emerging genres and game styles that fall outside of the game design culture’s major value system (Polansky 2015). Katherine Cross states that by reducing and removing game design elements considered essential, the walker challenges assumptions as to what games must contain (Cross 2016). Playing walker games reveals alternative values and areas of insight which fall outside the popular orthodoxy of game design understandings.

When taken together, these issues of gameplay conventions and limited critical design discussion reveal a knowledge gap within the field of game design. Although the alternative design focus of walker games exists within a contested game design space, many players find their exploration and experiences of game environments to be compelling. However, although there has been healthy critical conversation towards walkers and their cultural reception, there remains significantly less literature that provides critical and in-depth design analysis, to suggest specific design traits and characteristics of the genre. Although the walker challenges conventional game design theory, their played experience indicates potentially valuable insights in the
design of exploratory game experiences, which may broaden our understanding of game design.

To investigate walker design, I study the walker through a broad and multifaceted research approach. I draw upon areas of design outside of games, including interaction design (e.g. Gaver et al. 2003), and methods such as close readings (Davidson 2009) and research-through-design (Zimmerman et al. 2007). Investigation includes the design WORLD4, a creative walker-inspired project for practical insight in walker design and ambiguity within exploration environments.

1.2 Approach

To address this knowledge gap within the field of game design, in this dissertation adopt player interaction and spatial level-design as my main research lens. I acknowledge outside of my focus there are many other important facets of the walker genre. These deserve their own focused study including audio design and voiced narration but are beyond the scope of my dissertation.

My research seeks to answer the following three main questions:

1) What gameplay experiences do walkers elicit, and how might designers understand these experiences?

2) What are the game design attributes that engage players to explore 3D walker environments?

3) How can these design attributes be used to design first-person walker games and 3D games more broadly?

To answer these research questions, I have used a broad and multifaceted research methodology. Within this I adopt a practice-based approach, defined by Linda Candy
as a contribution to knowledge demonstrated through creative outcomes (Candy 2006). Within practice-based research a creative artefact is the basis of the contribution to knowledge, which I have produced in WORLD4. My approach includes reflection on practice throughout the thesis for contextualisation of creative work and the multiple mixed-methods I draw upon. Methods used were not pre-planned but have emerged and developed over the course of my research, in response to insights and findings, and study limitations. My approach raises question as to how game design researchers may investigate complex design areas for meaningful contribution, especially when working alone.

To answer research questions 1 and 2, I conduct a two-part qualitative analysis of the gameplay experience of four key walkers released in the period 2012 – 2013: Dear Esther (2012), Proteus (2013), The Stanley Parable (2013), and Gone Home (2013). I utilise a formal gameplay analysis framework (Consalvo & Dutton 2006) to highlight specific interaction, information, and spatial elements. I also utilise an informal close-reading framework (Davidson 2009; Bizzocchi & Tanenbaum 2011) for a more narratively-focused analysis of my walker gameplay. Insights are compared to walkers released in the period 2014 – 2018.

To answer question 3, I designed WORLD4 in response to findings and insights from my analysis of the four walker games. I utilise a research-through-design approach (Zimmerman et al. 2007; Pinchbeck 2010) to support my practice-based design investigation.

To further address question 3, I conduct a two-stage player study of WORLD4 to collect qualitative data for further analysis. I adapt grounded theory methods for observational and interview data of 14 players’ WORLD4 experience (Charmaz 2006;

Analysis of player data has revealed three themes derived from WORLD4, discussed in 6.1. Using discussions within these three themes, I articulate six strategies for fostering ambiguity within exploratory environments.

1.3 Limitations

Within this dissertation I acknowledge potential limitations in my research approach, specifically within chosen focus, scope, methodology, and validity of findings.

My research concentrates on the game design field to maintain scope towards design focus, preferencing theoretical literature within popular design epistemology over broader scholarly studies. Specific emphasis is placed towards mechanical game and game level design. Consequentially, my research works with specific assumption biases of ‘game’ and ‘designed’ within the field, used to identify gaps within existing design knowledge in articulating walker traits, concepts, and experiential qualities. This motivates my research and the construction of suitable design language.

As the walker is an emerging genre many developments are ongoing, presenting difficult choices in delimiting selection criteria for design investigation. To constrain breadth, my research concentrates on four key titles in the 2012 to 2013 period for analytical depth. This moment in time reveals an emergence of the walker as an aesthetic movement in collective style, popularly establishing the genre. Importantly, all four games received critical acclaim, commercial success, and were landmark in exposing the movement in a moment of widespread cultural conversation. I acknowledge limitations in my historic focus, which I address through discussion of
and comparison to recent genre developments, situating research findings within a contemporary cultural context.

In my research-through-design approach, I acknowledge limitations in concentrating on a single-project, WORLD4. Multiple projects as part of an evaluative iterative design process were out of methodological scope and focus. Instead, I limited potential design iterations to a single project, which I discuss and analyse in-depth. Discussion concerns choices and challenges made during the design process; a series of small, specific iterations in response to technical developments and informal player tests.

To study the designed experience of project WORLD4 14 volunteer players were recruited as participants; I acknowledge limitations in the generalisability of insights when drawing from a small sample group. Given the multi-stage nature of my research, a larger scale study was out of scope, and instead prioritised an in-depth analysis of each player’s game experience, using multiple data capture and thematic analysis processes.

Findings do not seek to provide a conclusive answer as to the ontological nature of the walker genre; the cultural conversation surrounding the genre continues to quickly change. Instead, the outcome of this study is to provoke questions towards existing design knowledge and reveal meaningful walker insights, which open new conversations about possible design strategies within the broader game design field. In doing so, my study seeks advance game design knowledge by presenting an understanding of spatial-exploratory ambiguity, highlighting considerations, potential experiential effects, and applications.

1.4 Contribution

This research contributes to the following areas:
**Game design practice:** I provide implementation details and insights gained from the design of my project *WORLD4* and the application of walker design themes. Furthermore, my work identifies a set of strategies for fostering ambiguity within spatial-exploration environments. Game designers may seek to use these design strategies to design their own engaging exploratory walker games or to enhance explorable environments in other game design types.

**Game design theory:** I provide design insights into the walker genre and identify four shared themes in their common traits and characteristics. In doing so I contribute towards an understanding of the walker and areas of ambiguity and curiosity within a game design context.

**Game studies:** I conduct a broad overview of the walker to highlight its specific historical and contemporary cultural-context. By raising historical counter-cultural precursors and recent developments, I contribute to a scholarly understanding of the walker as an emerging game style and genre.

**Game design research methods:** I present considerations for independent game design researchers in conducting contextually aware player study data collection and analysis. I identify the advantages and disadvantages in adopting time and resource-conscious scholarly and ‘indie’ game developer methodologies, specifically for researchers working alone, and highlight the importance of methodological innovation within the field.

### 1.5 Thesis Structure

In this section, I discuss the remaining thesis structure.
Chapter 2: Framing the Walker

In 2.1, I discuss *Dear Esther* (2008, 2012, 2016), a seminal walker game that popularised the walker genre, highlighting my areas of investigation. In 2.1, I discuss chronological precursors to *Dear Esther* (2008) and the walker within my areas of investigation. In 2.3, I identify key developments in the genre, and tensions issues and implications of the walker within the game design field (Gursoy 2013). I discuss the walker in relation to foundational game design literature (Salen & Zimmerman 2004; Schell 2008; Koster 2004).

Chapter 3: Walker Analysis

In 3.1, I discuss my approach in conducting an analysis of four key ‘walking simulator’ games: *Dear Esther* (2012), *Proteus* (2013), *Gone Home* (2013) and *The Stanley Parable* (2013). In 3.2, I discuss four common overarching walker design themes that surface through the analysis: 1) Player Interaction; 2) Temporal Space; 3) Player Focus; and 4) Ambiguity (Gaver et al. 2003). In 3.3, I discuss the trait of ambiguity in depth by drawing upon broader design theories (Gaver et al. 2003; 2004; Deterding 2011; Sicart 2014) and identify the designed walker experience as falling between ‘played’ and ‘gamed’, in which an experience of curiosity may manifest (To et al. 2016, 2017).

Chapter 4: Design Project, WORLD4

In 4.1, I discuss my motivation and adoption of practice-based methods for material and more generalisable design knowledge (Zimmerman et al. 2007; Pinchbeck 2010). In 4.2, I introduce *WORLD4* and discuss how I designed the project through multiple iterations and drew from walker design themes and additional inspirations. In 4.3, I discuss *WORLD4*’s design in relation to the four walker design themes previously
identified. I highlight specific techniques in game and level design that pertain to designed ambiguity.

Chapter 5: Player Studies

In 5.1, I explain how I conducted Player Study 1 and collected data from players playing WORLD4 using adapted grounded theory methods (LeCompte & Schensul 2010; Charmaz 2006). In 5.2, I discuss unexpected limitations and methodological insights revealed during Study 1. In 5.3, I compare alternative methodological literature to address these limitations and issues. In 5.4, I discuss how I conducted Player Study 2 and collected data from players playing WORLD4 remotely, using adapted indie game developer methods (Jongh 2017; Daviau & Leacock 2017). In 5.5, I reflect upon my approach and offer methodological recommendations for conducting time and resource-conscious player studies suitable for game design researchers working alone.

Chapter 6: Design Strategies

In 6.1, I explain the three themes obtained from analysed player study data that describe WORLD4 player experiences. These descriptions include quotes from players that highlight and articulate their gameplay experiences. In 6.2, I articulate a set of six prospective game design strategies as guidelines for fostering ambiguity in the design of exploratory game environments. These design guidelines may assist game designers in developing engaging 3D spatial exploration experiences in walker games and in exploratory games more broadly.
Chapter 7: Conclusion

In 7.0, I summarise my research and juxtapose the conclusions from previous chapters. In 7.1, I describe how future research work could be done around my work in three specific areas. In 7.2, I present concluding remarks and reflect on my overall research. I argue in favour of more specialised and contextually aware game design research approaches in order to challenge and advance game design knowledge and practice.
Chapter 2: Framing the Walker

2.0 Overview

The ‘walking simulator’ is not a formally defined genre, but an aesthetic movement that can be understood through key moments in time. In this chapter I seek to investigate what gameplay experiences walkers elicit, and the unique challenges the walker presents to the field of game design, by understanding its background and cultural context. In doing so I historically contextualize my research for designers and inform my methodological approach to investigate the genre within a design context, in Chapter 3.

For my research I focus on Dear Esther (2008, 2012, 2016) and later, three additional walker titles which I identify as key in popularising the genre. I identify three game design areas of interest in Dear Esther, which I use to investigate key moments and relevant precursors to the walker genre. In doing so I situate my research within the historic and ongoing cultural context of walker discussions and developments, and contextualise questions surrounding the walker within the game design landscape.

This overview is not representative of the genre at large or as a collective style and use of the collective terms walking simulator and walker is contentious. My research seeks to avoid mischaracterisation of the genre and its cultural context but, rather, to acknowledge context for the purposes of game design research limited in scale and scope. In doing so I seek to provide insights to better contextualise the unique design questions the walker presents.

In 2.1 I discuss Dear Esther, a seminal walker game in popularising the walker genre and style. I discuss Dear Esther’s background as a modification of the first-person
shooter *Half-Life 2* (2004) and its popular reception. I identify three specific three areas of interest in *Dear Esther*: 1) minimal mechanics; 2) explorable space; and 3) environmental narrative. I discuss each area, drawing upon relevant design literature in juxtaposition to *Half-Life 2*, and identify questions raised towards game design conventions.

In 2.2, based on these three areas of interest identified, I discuss chronological precursors to the walker genre. Precursors include ‘art mods’, which are mechanically minimal, non-violent modifications of first-person shooter games, mainstream environmental narrative innovations in first-person games, and ‘notgames’, which are artistically driven commercial titles. The discussion identifies similarities between the walker and counter-cultural game-making practices which raise similar questions towards design conventions.

In 2.3 I discuss three walker games that followed the release of *Dear Esther* (2012) in the 2012 to 2013 period, as additional key titles in the formation of an aesthetic movement and collective style. I highlight the commercial and critical success of these walkers and discuss their design characteristics in relation to *Dear Esther* (2012), and drawing upon their social and formal likeness, construct a preliminary genre definition. Following this, I utilise my definition to discuss the walker as an intensification of mainstream game design concepts. I discuss cultural tensions and issues surrounding the social formation of the walker genre, and despite this intensification, questions raised within the broader game design field. In doing so I identify limitations in existing theoretical game design literature to fully address or capture the unique characteristics of the walker experience as game design.

The discussion motivates a design investigation of four key walker titles in Chapter 3.
2.1 Dear Esther, the Seminal Walker

As I will discuss within Chapter 2 the cultural roots of the walker genre are debatable, however, Dear Esther represents key moments in time of what is popularly known as the walking simulator genre. Dear Esther (2012) and more recent key walker titles (see 2.3) have provoked controversy in relation to the walker as a legitimate collective style of game and game design (Gursoy 2011, p.57) and resulting questions as to the genre’s definition and characteristics are still topics of discussion (see Irwin 2017; Killscreen Staff 2016).

As such Dear Esther has done much to informally influence and establish stylistic traits and game design approaches that define the walker. In the following sections I present an overview of Dear Esther (2008, 2012) as a principal example of the formation of the walker style. I discuss the following areas: Dear Esther’s game experience, development background, counter-cultural design characteristics, and popular and critical responses. In doing so I foreshadow questions that the collective walker style raises.

2.1.1 Dear Esther: Game Experience

In Dear Esther the player meanders through a bleak seaside landscape, listening to an angst-inducing and ambiguous location-based voiceover monologue, and finding (although not collecting) artificial objects cryptically hidden along and within the natural geography of an uninhabited Hebridean island. The game environment is the focal point in Dear Esther, configured as a long, winding path and decorated by various landmarks: shipwrecks, diagrams in the sand, abandoned cottages etc. The navigable geography branches and converges as a constrained pathway, guiding traversal through geographical locales e.g. rolling moors and a cave network.
As they move, players may find or miss noteworthy environmental pieces such as geographical features and artificial objects. *Dear Esther*'s, environmental atmosphere is accompanied by an ambient nature soundscape and an evocative, sweeping orchestral score which complements the narrator’s monologues, enacted by player movement during navigation. To complete *Dear Esther* is to walk along its environmental path, divided over four connected game levels, and reach the final location, an omnipresent radio tower.

![Figure 2: Screenshot, Dear Esther (2008).](image)

An outdoor scene in the game featuring a blinking radio tower on the horizon. Note similarities with Dear Esther (2012) in Figure 3.

### 2.1.2 Dear Esther: Development Background

*Dear Esther* (2008) was one of three experimental ‘mods’ (modifications) created through a speculative research grant via the Arts & Humanities Research Council in the UK. Lead creator Dan Pinchbeck discusses its creation in *Dear Esther: An Interactive Ghost Story Built Using the Source Engine* (2008) as a practical means to investigate theoretical concepts highlighted in his studies. Pinchbeck’s prior doctoral
research (2006) included theoretical investigations into first-person shooter games and identified a connection in gameplay affordance between gameplay interactions and environmental objects, highlighted in An Affordance Based Model for Gameplay (2009). As I discuss in Chapter 4, Pinchbeck argues the advantages of adopting a practical game-creation approach in I Build to Study: A Manifesto for Development Led Research in Games (2010).

An experimental research project, Pinchbeck describes Dear Esther (2008) as having been created as a “storytelling experiment” with the goal of succeeding as a game within the public domain, not only to interest “an artistic or academic audience” but also to be “appealing for gamers” (2008). The first-person shooter Half-Life 2 was used as the technical and design basis for Dear Esther. Using developer-provided tools, Half-Life 2’s existing environmental assets (e.g. 3D models, textures, audio) were repurposed, and new 3D objects, terrain and audio (music and narration) were added. Half-Life 2’s central gameplay activities (e.g. combat, puzzle solving) were intentionally stripped out in what Pinchbeck describes as leaving “just the game world and story” as a focal point to enhance “players’ engagement with and interpretation of a narrative” so that player interest in non-traditional gameplay could be tested (2008). Dear Esther (2008) was released to the public as a non-commercial free modification of Half-Life 2 through the popular game modification website moddb.com.

2.1.3 Dear Esther: Design Attributes

I have chosen to focus on three specific design areas I have identified to discuss Dear Esther’s (2008) game design traits: 1) minimal mechanics; 2) explorable space; and 3) environmental narrative. These areas of focus do not cover all characteristics important to Dear Esther’s experience, such as its voiceover narration and orchestral
store, but this distinction is necessary in order to limit the scope of my game design focus. I discuss these areas in relation to *Half-Life 2* and draw upon relevant literature to compare design characteristics.

1) Minimal Mechanics

In *Dear Esther* (2008), *Half-Life 2*’s rudimentary player-character interaction functions that make up the actions of moving and aiming are retained: Movement (using WSAD on the keyboard to control walking actions) and view direction (using the mouse). These are the core game mechanics of *Dear Esther*. Core game mechanics are defined by game design theorists Katie Salen and Eric Zimmerman (2004) as the essential play activity players perform again and again; sometimes a single action. For example, Salen and Zimmerman specify in an FPS game the core mechanic is the set of interrelated actions of moving, aiming, firing, and managing resources e.g. health, ammo, and armour. Core mechanics create patterns of behaviour, which manifest as experience for players; “the mechanism through which players make meaningful choices and arrive at meaningful play experience” (Salen & Zimmerman 2004, p.317).

In *Dear Esther* the player’s central means of interacting with the game-space, make up the core mechanics of movement and observation. Other interaction functionality, like a contextual ‘use’ action (E) (e.g. to open doors or pick up objects), ‘crouch’ (Left-Control) and ‘sprint’ (Left-Shift) in *Half-Life 2* were removed, although a vision ‘zoom’ was kept and reassigned to the left mouse button. Many of these choices have a consequential effect on actions players may perform. For example, the ability to shoot, a core part of *Half-Life 2*’s gameplay (bound to the left mouse button), was removed, as were any traces of combat mechanics and hostile and non-hostile non-playable characters (NPCs).
In doing so *Half-Life 2*’s core rules and complex algorithms constituting its gameplay experience are significantly altered; for example, removal of health status, stamina, items to collect and use. Consequently dexterity-based challenges, solvable puzzle-based problems and combat-based conflict are removed, as are associated components including failure states and goals such as completing puzzles and combat scenarios to advance through the level. In doing so, the game mechanics in *Dear Esther* push against is an idea of readily identifiable actions within the game experience.

*Dear Esther* (2008) presents an alternative reframing of *Half-Life 2*’s gameplay and game experience. As I expand upon below and in 2.3, *Dear Esther* and walkers are one of multiple major points, at which gaming culture beyond academia has grappled with questions of “what is a game”. For example, Salen and Zimmerman’s definition of a designed game as “a system in which players engage in an artificial conflict defined by rules, that results in a quantifiable outcome” (Salen & Zimmerman 2004, p.80) does not clearly apply to *Dear Esther*, a point which I grapple with.

Pinchbeck himself describes this alteration as “just an environment to explore with embedded music and voice-over triggers” (Pinchbeck 2008). Katherine Cross describes *Dear Esther* (2012) as “personified minimalism. It made it okay to cut away nearly all a game’s mechanics so that we could see and truly explore what was left; a pure interactivity, if you will” (Cross 2016). This approach to minimal interactions has been described by Brendan Keogh as an explicit attempt at mechanical minimalism (Keogh 2015), a trait identified across multiple walker games (see 2.3).
2) Explorable Space

Pinchbeck describes reducing *Half-Life 2* “leaving just the game world and story” and *Dear Esther’s* (2008) “narrative, visual element and audio” as a primary source of engagement within the played experience (Pinchbeck 2008). The game world is a fully 3D “mapped” space (Salen & Zimmerman 2004), a common element and source of engagement in many 3D first-person games. When compared to more complex genres and styles of game e.g. the first-person shooter (FPS), potential obstructions, impediments and conflict have been removed from the 3D environment. For example, Hullet and Whitehead identify the following gameplay traits within FPS 3D game level design: challenge; navigation; segmentation; tension; and pacing, which inform patterned level design techniques such as the combat “choke point” or “arena (Hullet & Whitehead 2010).

Although many FPS level design characteristics within Hullet and Whitehead’s taxonomy do not clearly apply to *Dear Esther* (2008), some specific level design traits do: navigation; spatial segmentation; and pacing. For example, *Dear Esther* (2008) uses level design navigation techniques such as signposting and landmarking, derived from foundational architectural theory (Lynch 1960). Level design theorist Christopher Totten discusses these navigation techniques as commonplace in 3D FPS games to assist and guide navigation, and to foreshadow destination (Totten 2014). For example, in *Half-Life 2* an omnipresent tower functions as a navigation landmark and signifies the player’s eventual goal. *Dear Esther*, features an omnipresent radio tower landmark with a flashing red light, used to similar effect (see Figure 2).

In addition, *Dear Esther* (2008) utilises fundamental level design approaches to architect its navigable game space, similar to what can be found in an FPS like *Half-
For example, certain architectural elements identified by Totten are in both *Half-Life 2* and *Dear Esther*. These include mazes and labyrinthine spatial layouts, and spatial types such as pathways and “nodes” (Totten 2014, p.118) to obscure the horizon and assist navigation flow and pacing.

Such level design approaches when used in an FPS like *Half-Life 2* inform design techniques such as combat “gallery”, “choke point” and “arena” (Hullet & Whitehead 2010). However, within *Dear Esther’s* more mechanically minimal and non-violent spatial context, these approaches are reframed for solitary exploration and atmosphere.

3) Environmental Narrative

The contextual reframing of the game space in *Dear Esther* (2008) alters environmental content such as the 3D objects normally found in *Half-Life 2*, which often have a clearer purpose. In *Half-Life 2* environmental objects may afford gameplay interactions such as combat or puzzle-solving game mechanics, for example health status and ammunition that can be collected and used. Other environmental objects include those decorative, which may contain narrative information. These are what Totten defines as “environmental storytelling objects; repeatable objects that create small stories” (Totten 2014, p.284). As Pinchbeck identifies in his theoretical work (2009), the player’s relationship with such objects can be modified and blurred through an altering of the object’s affordances.

In *Dear Esther* (2008) there are only decorative and environmental storytelling objects. These include recurring objects such as paper boats, candles and circuitry diagrams. Collectively these can be understood as embedded narrative elements, defined by
Henry Jenkins as self-contained environmental elements that impart story information (Jenkins 2006, p.118).

Although both Half-Life 2 and Dear Esther (2008) make significant use of formal embedded elements, both differ significantly in context. In Half-Life 2 embedded elements are often used to support major plot points, and consequentially, are clearer in their narrative meaning conveyed. For example, angular science-fiction architecture overwhelms historic buildings throughout the dystopian setting, illustrating the alien oppressor’s dominance. Other examples are more clichéd, including graffiti in the abandoned town Ravenholm left by (presumably deceased) inhabitants warning away others of the dangers within.

Unlike Half-Life 2, the relationship between these embedded elements in Dear Esther (2008) is less clear. Objects never contain explicit gameplay affordances or narrative information. For example, Dear Esther employs the graffiti technique, however to display an ethanol chemical diagram. The meaning of the diagram is symbolic and remains ambiguous throughout the experience; it does not clearly substantiate plot points, but gestures towards other objects (i.e. car parts) and points within the voice-over monologue (i.e. a car accident). As such, any clear distinction of purpose between decorative and non-decorative objects as embedded elements are blurred, rendered vague and unclear in narrative meaning and significance.

We can imagine Half-Life 2 with similarly ambiguous embedded elements, however, in Dear Esther’s exploratory gameplay context these are a primary source interest, to be observed and questioned. This type of non-mechanistic gameplay interaction is described by Cross as a process of “meaning making” as players “draws connections” between unclear game elements in order to make sense of them (Cross 2015).
*Half-Life 2* and *Dear Esther* (2008) use the audio-visual characteristics in explorable spaces to evoke a strong sense of atmosphere for narrative effect. Environmental design in *Half-Life 2* conveys a dystopian science fiction world, in *Dear Esther* an isolated and mysterious Hebridean island. This characterisation of the 3D space can be considered evocative, which Celia Pearce defines as a sense of narrative place and continuity being evoked through specific spatial design decisions, such as decoration and layout (Pearce 2007).

Jenkins describes evoked space as having a narrative effect; an evoked narrative rises through a combination of “the material qualities” of the navigable game world (Jenkins 2006, p.118). Michael Nitsche similarly discusses game spaces as evoking narratives “because the player is making sense of them in order to engage with them” and in doing so surfaces narrative meaning (Nitsche 2008, p.3).

In summary, in *Dear Esther* (2008) the design areas discussed – 1) minimal mechanics, 2) explorable space and 3) environmental narrative – share similarities with FPS *Half-Life 2*, but also diverge significantly in its mechanically minimal design context. It could be said that *Dear Esther* is reflexive and counter-cultural to the FPS by questioning and reducing design conventions. However, despite rejecting many FPS conventions, *Dear Esther* is evidently influenced and inspired by the FPS genre. *Dear Esther*, paradoxically adopts and recontextualises FPS game technologies and design traits such as in level design and environmental storytelling.

### 2.1.4 *Dear Esther*: Commercial Re-release and Popular Reaction

Reflecting on *Dear Esther’s* 2008 release, Pinchbeck (2008) notes that its reception was “extremely positive” despite criticism of technical shortfalls, slow movement speed and a lack of conflict or combat, and asserts “the community has loved the mod”,

noting positive player comments in relation to atmosphere, music and voice acting (Pinchbeck 2008). In 2012 Dear Esther received a commercial re-release, a remastering created in collaboration with developer Robert Briscoe, released digitally on the online game platform Steam.

Figure 3: Screenshot, Dear Esther (2012).

An outdoor scene in the game featuring a blinking radio tower on the horizon. Note, despite differences in fidelity, the similarity in in-game location to Figure 2.

Dear Esther (2012) overhauled many aspects of the original modification to match mainstream consumer expectations of visual fidelity, with the benefit of having had prior exposure and the growing presence of independent or ‘indie’ games online, as discussed in 2.2. Critical exposure of Dear Esther was noteworthy, as the ‘most nominated game’ at the Independent Games Festival 2012 and was a commercial success (Indie Fund 2012). Pinchbeck discusses Dear Esther’s re-release in a 2012 Game Developers Conference Presentation (Pinchbeck 2012) as a financial and critical hit, unlikely for a commercially alternative “pure-story-game”. The broad impact
of *Dear Esther*'s 2012 release, however, saw widespread discussion, debate and backlash online in relation to its stylistic traits and design characteristics.

Ayse Gursoy (2013) documents differences in popular reception and discussion between *Dear Esther* (2008) and the commercial re-release of *Dear Esther* (2012). Similar to Pinchbeck, Gursoy notes a favourable online response to *Dear Esther* (2008), specifically excited player comments towards it as a self-described “interactive ghost story”. Comparatively, following the 2012 commercial release, Gursoy (2013) notes *Dear Esther*'s (2012) design characteristics became the focus of widespread discussion and debate within online communities, specifically as to accepted notions of interactivity and gameplay conventions. Outside of a commercial game modification context *Dear Esther*'s “interactivity” became a primary talking point; this term was used to either “justify its consideration as a game, or to protest it” (Gursoy 2013, p.21).

Killscreen Staff describe *Dear Esther* (2012) as drawing “a lot of hatred, partly because it was labelled a ‘videogame’ and some viewed its low interactive demands as not being qualified (it has no true fail state, no ‘mechanics’ outside of walking and looking around), and partly because this type of game was being sold at a price” (Killscreen Staff 2016). In a 2016 interview Pinchbeck describes a difference in expectations as a commercial title with game audiences; there is an “illusion of simplicity with games like *Dear Esther* that people kind of assume, because there's not a lot of mechanics, there's not much going on in that sense” (Cross 2016). *Dear Esther*, became a “site of public contestation of the formal qualities of the medium”, revealing underlying interpretative difficulties between its stylistic approach and popular formalistic understandings of gameplay conventions and game design (Gursoy 2013, p.9).
Following the release of *Dear Esther* (2012) titles with similar design traits were released on Steam and received critical acclaim. These include *The Stanley Parable* (2013), *Proteus* (2013) and *Gone Home* (2013). I expand on these titles in this 2012 to 2013 period in 2.3, as a key moment in the popular establishment of the genre. Despite intentionally negative connotations, Pinchbeck describes the term walking simulator as a collective “identity” for these similar games (Cross 2016).

As I discuss further in 2.3, *Dear Esther* (2008) and its subsequent re-releases present an interpretative ‘gap’ within the broader game design vernacular. Cross states “[*Dear Esther*] made space for developers to clear all the excess and only restore those interactive bits that were truly needed, rather than assuming that a game must always have x, y, and z” (Cross 2016). In doing so *Dear Esther*, like other key walkers, have eluded popular and established definitions of games and understandings of game design.

### 2.2 Chronological Precursors to the Walker

In this section I seek to further our understanding of questions surrounding *Dear Esther* and other key walkers, through a discussion of cultural and historic precursors within the game design field that have contextually challenged design conventions. To do so I adopt specific focus on the three design areas previously identified in 2.1: 1) minimal mechanics; 2) explorable space; and 3) environmental narrative. In addition, I place specific emphasis towards the FPS genre because of its historical and cultural link to *Dear Esther* and other key walker games which I highlight. In addition, I highlight cultural precursors within the commercial game space that predate the establishment of the walker, which I discuss in 2.3.
I acknowledge that my specific focus towards the FPS genre and specific cultural precursors does not fully reflect all relevant precursors, nor presents an accurate or comprehensive history of the walker. For example, Cross argues that walker games owe “a lot to Twine games with their strong narrative emphasis” (Cross 2016). However, by adopting this focus and limiting research scope and breadth, I can more concisely interrogate design questions raised within the three specific game design areas.

Precursors include counter-cultural ‘art mods’ that seek to challenge and subvert FPS design conventions through alternative and subversive approaches, mainstream innovations in first-person game designs and environmental narrative, and mechanically minimal commercial notgames as cultural precursors to the walker genre. In doing so I highlight relevant cultural context for discussion in 2.3, which includes the frequent blurring between non-commercial DIY and commercial titles, and changes in game-making practice.

2.2.1 Counter-Cultural Art Mods

The artistic computer game modification or art mod is described by Rebecca Cannon as a subset of game modding, glitching, hacking and creative DIY, and as non-commercial game-development practice (Cannon 2007). This involves the creative reuse of pre-existing game software or hardware for a specifically artistic outcome. Walt Scacchi describes art mods as modifying “the game play experience through manipulation, intervention, appropriation, or other creative transformation of a game’s original visual content as it is consumed by users during a play session” (Scacchi 2010).
The rise in popularity of game mod making and subsequently FPS art mods is often attributed to the seminal FPS *Doom* (1993), frequently attributed the credit for popularising the FPS genre and providing accessible 3D mod-making tools; for example, its modular .WAD file format. As artist and game developer Robert Yang discusses, much 3D FPS mod-making involves experimentation outside of what would normally be acceptable to more risk-averse commercial game developers (Yang 2012).

Contemporary *Doom* art mods include *Autobiographical Architecture* (LeBreton 2016), which reduces the combat mechanics associated with *Doom* for an exploratory narrative akin to *Dear Esther*. In discussing these *Doom* mods, Liz Ryerson notes that these gameplay alterations “point out all of the unmanifested realities a commercial game like *Doom* could never hope to touch upon” (Ryerson 2018).

In discussing the art mod community, Cannon notes that mod creators frequently question existing game conventions and themes such as “killing and dying” and the “addictive fervour of gameplay” (2007). Mod creators choose to respond to these questions through reinterpretation of this familiar subject matter (Cannon 2007, p.1). We can draw parallels between these formal, aesthetic, and critical concerns driving art mod creation, and Pinchbeck’s motivations in creating *Dear Esther* (2008) as discussed in 2.1.

Cannon describes art modders as “playing with the medium of Play” (2007, p.1) to fulfil these motivations. Scacchi describes art modders as exploring “appropriation and intervention as tactics for using modded games as static, dynamic, or performance art work” (2010). An art mod example includes *Velvet-Strike* (Anne-Marie Schleiner, Joan Leandre & Brody Condon 2003), a further modification of the popular FPS *Half-Life*...
(1998) modification *Counter-Strike* (2000) that includes anti-war graffiti for non-violent protest in-game. These concepts of ‘playing with play’ and appropriation and intervention are discussed by theorists such as Mary Flanagan (2009); *Velvet-Strike* could be considered a persuasive game, as it recontextualises combat-based gameplay to raise awareness about social and political issues, fitting with Flanagan’s own definition (2009, p.248).


Like Pinchbeck, these mod creators utilised *Half-Life 2* as an experimental foundation, reducing its core mechanics and prioritising spatial and narrative elements, such as environmental exploration and audio voiceover, for an alternative and often more formalistically critical and artistically focused experience.

Through art mods we can understand that the walker has emerged from a long-running cultural trend of alternative, counter-cultural game-making practices. These practices utilise existing games and genre conventions as a form of intervention and appropriation for formal, aesthetic, and critical commentary, or artistic expression. Such works raise questions around and challenge common game values and game design conventions. The walker, notably *Dear Esther*, is a distinct example of ongoing shifts in game-making practices (see 2.3).
2.2.2 Non-Violent Spatial Exploration Mods

Within art mods there has been a movement in spatially-focused experimentation described by Cannon as “hard-core minimalist reductions” of FPS game conventions (Cannon 2007, p.6). These art mods like *Dear Esther* (2008) reduce FPS combat mechanics and priorities level design elements for non-violent, spatial exploration gameplay experiences.

Art mod maker JODI transforms FPS levels into abstract, non-violent, exploratory environments: starkly white spaces with chaotically shifting shapes and geometric patterns, and without specific scenarios or coherent game instructions. Cannon describes JODI’s mods as “reducing mobility, enemy identification, narrative cognition, reward systems, landscape and even gravity – to mere symbolic fragments”, playing with the semiotics of game space navigation and leaving players “without any sense, objective or intention” (Cannon 2007, p.6).

Tobias Bernstrup modified the FPS *Unreal Tournament* (1999) to re-create urban Berlin virtually in *Potsdamer Platz Unreal Edit* (2001). Emphasis is placed on the architecture and the sensation of solitude within the space, depicted as abandoned. This experience is described by Bernstrup as “not really a game, there is no goal, it’s very much about just being lost” (Cannon 2007, p.109).

Bernstrup describes varying responses to *Potsdamer Platz* from game-players and non-game players. Game-players are described as agitated when playing, asking “where are the guns? Can I kill someone?” and as scared and tense in concentration, “expecting something to show up around behind the corner” (Cannon 2007, p.110). In contrast, players unfamiliar with games are described as being “just kind of excited or
confused or sometimes they just get lost”. Bernstrup reflects on this, stating “I think it’s a nice thing that they [game players] feel alienated in a way” (Cannon 2007, p.110).

As noted in 2.1, a similar player experience in *Dear Esther* (2008) is noted by Gursoy (2013) as observed in player comments online; players describe an experience of tension as the game is self-described as an “interactive ghost story”. In walker *Gone Home* (2013) an experience of solitary, atmospheric tension is evoked through horror tropes used to create a sense of dread in its solitary domestic setting (discussed in 2.3 and 3.2). This is, however, intentionally misleading for narrative subversion that unfolds.

Bernstrup notes that, by adopting non-violent exploration, the game space and experience are significantly reframed for solitary self-reflection: “the idea of doing nothing, just walking around, no interaction so you are really left alone and sometimes you even feel lost … I think here you can spend a lot of time, thinking, like, ‘What am I doing?’, ‘Who am I?’” (Cannon 2007, p.115). We can draw parallels between this experience of spatial solitude and reflective questioning with *Dear Esther* (2008, 2012) as discussed by Cross (2015) (see 2.1) and in more recent walkers. For example, game theorist Miguel Sicart describes *Proteus* (2013) as a space for interpretation and self-reflection through exploratory play (Sicart 2014, p.55), discussed further in 2.3 and 3.3.

More recently, non-violent spatially focused ‘game tourism’ modification is a self-described form of art modding catalogued by LeBreton (2017). This is described as altering existing games to support ‘tourist play’ in the “primary aim of exploring its world, without engaging in any active conflict such as combat or stealth”, and in doing so the player’s attention is refocused “on the game’s architecture, aesthetics,
storytelling, and atmosphere” (LeBreton 2017). Furthermore, game tourism mods have become a popular feature in various game genres, discussed by Greer (2018), and have even been officially integrated as game modes e.g. SOMA (2015). As I discuss below in 2.3, these developments reveal a blurring of counter-cultural movements back into the mainstream.

These mods present similar characteristics to walker games but differ in that they re-characterise the existing game experience through modification, rather than using the existing game as a foundation for an original experience, such as in Dear Esther (2008). These spatially focused art mods share similarities to walker games in reframing the game space for solitary exploration and an evocative atmosphere. In doing so they raise similar questions around valued gameplay types and focus in game design, specifically in highlighting the 3D environment as its own source of interest and experience.

2.2.3 First-Person Environmental Narratives

Although art mods exemplify an alternative, counter-cultural approach to challenging gameplay and design conventions, it is important to note efforts within the commercial game space that have influenced much experimentation. These prior, influential commercial titles discussed below, in their own ways, exemplify alternative understandings of explorable game space and environmental narrative to FPS design conventions of their time, and provide a popular basis for counter-cultural game design. Discussed further in 2.3, the walker can be seen as the latest cycle of counter-cultural games diverging as both mainstream and DIY game design.

FPSs Half-Life (1998) and Half-Life 2 (2004) are critically acclaimed titles, noted for their detailed world-building, strict adherence to the first-person perspective and
utilisation of the game space for an alternative story-focused approach to the FPS. In *Half-Life* the game experience is framed as a continuous story journey through architecturally linked levels, unlike prior FPSs conventionally structured around discrete, maze-like levels. In *Half-Life 2* this story focus is further prioritised through embedded and evocative environmental narrative design, and complex scripted event sequences via environmental triggers; these techniques have influenced first-person storytelling in FPS games and walkers such as *Dear Esther* (2008).

Comparatively, multiplayer-focused shooter *Unreal Tournament* (1999) presents a wide array of stylised combat arenas with distinct visual styles such as labyrinthine medieval fortresses and urban sci-fi dystopias. Although focused on multiplayer combat, *Unreal Tournament* allows players to play alone and freely explore levels without competitors or engaging in combat, or alternatively as a floating ‘spectator’ camera able to navigate the map and pass through physical 3D geometry, a disembodied entity able to view the map from angles, locations and heights otherwise unattainable. These techniques were applied and re-contextualised by Bernstrup in his art modification *Potsdamer Platz Unreal Edit* (2001).

Popularly dubbed ‘immersive simulators’ such as *System Shock 2* (1999) and *Thief: The Dark Project* (1999) can be considered influential in reframing the FPS away from shooter design, towards more exploratory and narratively focused experiences. Influenced by classic computer role-playing games, immersive simulators share noticeable traits and similarities with the FPS such as perspective and combat mechanics. However, these titles offer significantly different experiences and design values. Combat is a gameplay choice and players may freely explore highly detailed game environments often filled with intractable objects and embedded narrative elements. These may be picked up and held in-game, to be examined or used. The
immersive sim has directly influenced walkers like *Gone Home* (2013), which strips out the action gameplay elements from the immersive sim, a choice discussed at length by principal designer Steve Gaynor (Gaynor 2012, 2014).

### 2.2.4 Mechanically Minimal Indie Notgames

In the intervening time between *Dear Esther* (2008) and its commercial re-release *Dear Esther* (2012), there were numerous alternative 3D games that shared some identifiably similar, counter-cultural and stylistic design traits. These reveal cultural shifts in game-making practices and the critical and popular visibility of less traditionally mainstream games. Below I discuss an example; two commercial self-described notgames by the developer Tale of Tales. These titles were created with an intent to critique popular formal and aesthetic game values, and explicitly challenge conventions through an emphasise towards spatial exploration and a more suggestive type of environmental narrative.

In some ways these may be considered cultural precursors to the formation of the walker genre. *Proteus* (2013), for example, is self-described as an ‘anti-game’ by its two creators, Ed Key and David Kanga (Rose 2013). Tale of Tale’s works suggest broader cultural shifts within game-making practices and games landscape at the time, indicating a broader counter-cultural movement that predates the walker.

As discussed by Anna Anthropy (2012), there has been much growth in widely distributed, flexible and free game-creation toolsets and distribution methods. These have provided accessibility and growth in hobbyist and commercial game-making practices. Clarke et al. (2015) discuss the emergence and rise of independent or indie game-development practices, which frequently blur the distinction between DIY hobbyist and commercial studio game-making. These may include small teams or
single-person studios of game-makers, typically developing more constrained projects than those of larger publisher-financed studios. Events such as the Independent Games Festival and online blogs have brought critical and popular attention to indie games, which may feature alternative and counter-cultural concepts and themes.

Tale of Tales’ notgames are one such example. Articulated in the Notgames Manifesto (Samyn 2010), their motivation is a critique and challenging of established conventions and game values, similar to historic art mods. Although self-described as notgames, their titles have received critical acclaim at game events such as the Independent Games Festival (Samyn 2009) and been released as commercial titles on popular online game platform Steam. *The Path* (2009) and *The Graveyard* (2008) are two noteworthy examples that share stylistic similarities to walker games such as *Dear Esther* (2008) in their minimal use of game mechanics and aesthetic emphasis on explorable space and narrative.

In *The Graveyard* (2008), players control an elderly woman from a third-person perspective through a cemetery. Player control is limited, and the character’s movements are slow and laboured, conveying her age and fragility. *The Path* (2009) plays on the Little Red Riding Hood fable. Players control one of six sisters (from a third-person perspective) with the instruction ‘go to Grandmother’s house and stay on the path’. Players may obey or disobey the instruction and wander and explore the surrounding forest, altering the story conclusion.

Creators Harvey and Samyn describe most of the story in *The Path* as suggestive and non-explicit, relying on the player’s active imagination. This is similar to Cross’s description of “meaning making” in *Dear Esther* (2008) in imagined “mental maps” of game elements (Cross 2015) (see 2.1). At the time *The Graveyard* and *The Path* were
unusual for commercial titles sold on the Steam platform, still then synonymous with action and multiplayer FPSs like *Half-Life 2*. As expressed in Harvey and Samyn's *Beautiful Art Program* essay, the placement of their work on a principally gaming platform was part of a concerted effort to provide “deep aesthetic joy” to a wide audience through videogames (Harvey and Samyn 2013). We may draw a parallel to Pinchbeck (2008) in his intent to create *Dear Esther* (2008) as “appealing for gamers” within the FPS mod-making domain.

Tale of Tales’ works suggest a broader cultural shift in stylistic and critical approaches, subject matter, and game-making practices. In addition, their work suggests a growing public profile of more unconventional or counter-cultural games and design approaches, predating the creation of the walker genre. As the different releases of *Dear Esther* (2008, 2012, 2016) suggest, the walker is one example of broader cultural shifts within DIY and commercial game-making practices.

In summary, we can understand *Dear Esther* (2008) and the walker as having partly emerged from counter-cultural art modding practices, a counter-cultural reimagining of the FPS for mechanically minimal, non-violent experiences which reprioritise FPS design conventions for focus on spatial exploration and environmental narrative. We can understand how innovations and diversions in popular FPS titles have influenced walker games, having reframed design conventions for more exploratory, narratively focused experiences. Finally, notgames highlight shifts in cultural context that predate the walker towards more public facing, mechanically minimal and critically aware, spatially and narratively focused game experiences.
2.3 Current Walkers

To begin I discuss three key walker titles released the year following *Dear Esther* (2012): *The Stanley Parable* (2013), *Gone Home* (2013) and *Proteus* (2013). I identify 2012–2013 as a key moment in the formation of a collective ‘walker style’, highlighting critical acclaim and commercial success. I discuss characteristics relevant to the three specific design areas identified in 2.1, and briefly highlight the traits of minimal mechanics, explorable space and environmental narrative. I use this shared likeness to construct a preliminary definition of the walker genre, drawing upon arguments for the construction of genre for design research purposes discussed by Goddard and Muscat (2017).

Following this I discuss the collective online debate, criticism and backlash towards key walker titles. I highlight tensions and issues within the broader games field in the establishment of the walking simulator label as a derogatory categorical genre. We may understand this moment as raising latent questions surrounding the walker, revealing limitations of popular game design literature in discussing the walker’s stylistic design characteristics and experiential qualities.

Finally, I highlight recent walker developments in the 2014–2018 period as part of an ongoing movement in the wake of popular backlash. I note cultural shifts within the walker, between ‘studio’ walker titles and counter-cultural DIY walker titles. Studio is in reference to games developed by larger teams, often more resourced than single-person DIY creators or duo-teams, and higher in visual fidelity. I highlight how the questions raised continue to surround the walker, which has eluded foundational, established game design understandings despite current developments.
2.3.1 Key Walker Games: 2012–2013

As noted in 2.1, following the release of *Dear Esther* (2012) were multiple games with identifiably similar stylistic traits within a similar time period. *The Stanley Parable* (2013), *Gone Home* (2013) and *Proteus* (2013), like *Dear Esther* (see 2.1), were independently funded titles released on the Steam platform. All received critical acclaim, for example honourable mentions, nominations and awards at the Independent Games Festival in 2012, 2013 and 2014. The critical and popular reception of these titles as key in establishing the walker as a popular movement and genre; I adopt these four key titles as a point of focus, here and in my walker analysis in Chapter 3.

Each of these three nominal walker games features obvious design similarities within the three areas identified in *Dear Esther* (see 2.1): 1) minimal mechanics; 2) spatial exploration; and 3) environmental narrative, which can be identified as collective design traits within the aesthetic walker movement. I note many appealing aspects within these walkers extend beyond my chosen focus towards mechanistic and level design elements, for example, in writing and audio. My perspective does not intend to capture all appealing qualities and aspects of the walker but highlights how spatial-exploratory design is highly relevant in all of these walker games.

*Gone Home* was a finalist for ‘excellence in narrative’ at the 2013 IGF awards. As discussed in 2.2, *Gone Home* was heavily inspired by immersive sim games (Gaynor 2012, 2014). Players explore a large, mysterious, empty family home and may move, look, listen and ‘touch’ or ‘hold’ detailed 3D household objects. Like *Dear Esther* (2012), *Gone Home* is a solitary experience that places focus on its ambiguous environment, made up of an interconnected network of rooms and halls to be searched.
and investigated. Much of Gone Home’s environmental narrative is embedded (Jenkins 2006) within object details. For example, discoverable written letters and bedroom objects characterise the inhabitants of the house, revealing an underlying interpersonal narrative. In addition, part of Gone Home’s appeal lies in nostalgia of its 90s period setting, and queer identity politics around representation within games and popular media.

The Stanley Parable was nominated for three IGF awards in 2013 and was a finalist for three categories in 2014. As noted in 2.2, The Stanley Parable is a commercial re-release of the similarly titled 2011 Half-Life 2 mod. Like Dear Esther (2008, 2012) players may look, move and listen. The Stanley Parable takes place within a series of empty office spaces that are mysteriously networked as explorable branching pathways. Player exploration of the game space is narrated by an omnipresent and disembodied voiced character, the ‘narrator’. Unlike Dear Esther’s voiced monologue, the narrator speaks directly to the player and, as they explore, an evocative cryptic meta-narrative is revealed. The player is encouraged to playfully subvert the narrator through navigation and unravel a series of varied spatial and narrative vignettes, each with their own conclusion. Part of The Stanley Parable’s appeal is its extensively scripted comedy writing and the narrator’s sardonic delivery, in conjunction with discovering different endings within the level.

Proteus (2013) received an IGF nomination in 2012, the same year as Dear Esther (2012). As noted in 2.2, Proteus is described by its creators as an “anti-game”, like self-described notgames (Samyn 2010). In Proteus players explore a solitary island whose geography is randomly generated on starting. Players are free to explore through movement, observation and listening. Unlike high-fidelity 3D in the other three walkers, Proteus’s space is characterised by its pixelated and painterly 3D visuals and
its generative audio, music and effects that complement player movements and environmental conditions. Much of Proteus’ appeal also lies within its ambient and generative musical score. Although the island is mysteriously populated by artificial objects and narratively evocative in atmosphere, like Dear Esther, its environmental narrative is far less explicit. Emphasis is instead placed on wandering the island and discovering the naturalistic flora and fauna. As noted in 2.2, Sicart describes Proteus as an “emotional playground”, a space “designed for using the experience of play rather than its form to create emotions”, less structured and constructed in meaning conveyed (Sicart 2014, p.55). This experience shares similarities with Cross’s description of interpretive “meaning making” when playing Dear Esther (Cross 2015).

These four titles suggest the emergence of an aesthetic movement in collective walker style at this moment in time. Although these four titles differ in technical makeup, design, and experience (e.g. the painterly and wordless randomly generated world of Proteus to the intricate and dense family home in Gone Home), they collectively evidence significant formal similarities shared across each title:

A reduction of conventional first-person gameplay mechanics; a lack of non-playable characters (bar Proteus’ small animal creatures) and solitary exploration of an atmospheric fully 3D mapped space; an evocative environmental narrative structured and paced through the navigable environment – the game world itself is a principal character. In each walker we can also understand that information is discovered through an act of navigation, spread across the environment and often present within embedded visual details or level geometry and architecture. Importantly, discovery does not include the collection of such elements (bar a select few objects in Gone Home), like conventional game world item collection. Gameplay in each of these
walker titles involves an exploration of the space, in which discoveries motivate further exploration.

**Establishing a Genre Likeness**

In light of this particular cultural zeitgeist in 2012–2013 and an identified likeness in formal, aesthetic, and stylistic characteristics, for the purposes of this research I argue these qualities demarcate the walker as a genre; defined both culturally and formally. Drawing upon the adoption of genre focus for game design research discussed in Goddard and Muscat (2017), I argue this focus on this specific moment in time is appropriate in order to constrain research breadth, and a construction of ‘likeness’ is essential to motivate, orient and delimit my design research. I acknowledge my definition assumes a particular construction of what the walker is, demarcating spatial-exploratory elements, which is not necessarily correct in representing the genre. However, my definition of genre is not reduced to taxonomical claims and will be further substantiated through analysis that explicates the genre, including the social construction of the walking simulator genre in 2.3.3, influenced by these four key titles.

I acknowledge that collectively grouping these titles as walkers or describing them as ‘games’ is contentious. As Ed Key notes in an interview with Killscreen Staff (2016), “To take the previous example, *Proteus* and *Gone Home* are massively different in their approach to narrative and even interaction design, but according to Steam users they are the same thing because they are non-violent?” Furthermore, Street (2016) notes that, aside from *Proteus; Dear Esther, Gone Home* and *The Stanley Parable* are arguably removed from the counter-cultural roots of the genre, and are argued to be “pared back”, minimalist versions of narratively focused ‘Triple-A’ games (games with
I discuss these notions further in 2.3.3, including the recent cultural diversification of walker styles.

**Similarities to Mainstream Design**

Although I acknowledge and agree with Street’s (2016) assertion of significant cultural and experiential differences between walker titles, drawing upon my genre definition and historical context (see 2.1 and 2.2) I argue these titles reveal the walker as an intensification of key mainstream concerns within the game design field, most notably in a construction of explorable 3D game spaces and storytelling environments.

At the ‘AAA Level Design in a Day Bootcamp’ Game Developers Conference 2013, *Gone Home* designer Steve Gaynor (2013) discusses level design techniques for in-level storytelling without taking control away from players, learned during his time working on the *BioShock* (2007) FPS titles and drawing upon popular first-person action games *Half-Life 2* (2004) and *Dishonored* (2012). Techniques include environmental framing (using specific layouts e.g. dog legs or s-locks) to direct player focus, adjusting gameplay interaction mechanics to minimize distractions, using staging and lighting to draw attention and set tone, architectural gating to prevent bypassing of crucial objects or locations, and careful consideration of environmental objects to convey thematic or narrative meaning. Gaynor notes these FPS level design approaches are extrapolated in *Gone Home*, applied across a single environment rather than multiple self-contained levels. Similar principles are present within walker games *Dear Esther* and *The Stanley Parable*.

Furthermore, Craig and Gaynor (2015) discuss challenges in creating *Gone Home*’s level as both a believable fictional space and one compelling to explore, drawing connections to larger triple-A studio approaches. Discussion covers topics such as:
creating an impression of player choice through level architecture by using recurring locations and branching junctions, appropriate abstractions of common real-world spaces to convey game space as believably grounded in reality, and the presentation of a ‘lived-in’ environment through specific application of decorative objects and surface materials.

Parallels between techniques in walkers and mainstream genres are visible in other level design discussions. For example, Ubisoft level designer Menzel (2017) discusses control of storytelling within game levels through a combination of orchestrated events activated by player position, and environmental storytelling; a technique we can identify throughout The Stanley Parable. Arkane Studios level designer Lee (2017) discusses high-level considerations for ‘holistic level design’ used within Dishonored 2 (2016). Lee contends that players may build an intuitive understanding of the game world during gameplay activities, through harmonious pairings of elements within game level composition, for example, use of clear navigational and narrative affordances within an architectural layouts and object props to convey dual meanings.

McMillan (2012) discusses principles for situational awareness in first-person games. Although concentrated towards combat-based game types, considerations are broad including camera field of view, limiting situational awareness through visual occlusion, and manipulation of visible sight-lines to alter a players’ emotional state. Deus Ex: Mankind Divided (2016) level designer Maurer (2017) discusses ‘meaningful exploration content’ design within open-ended explorable game environments. Maurer focuses on ‘exploration set ups’ to sustain player interest during navigation of a recurring game world. Key principles include open accessibility of level locations, granting rewards upon discovery, creating narrative links between locations for
continuity, and telling compelling self-contained ‘mini-stories’ within locations through decorative environmental details.

Within a similar time period to key walker titles, other designers experimented with alternate approaches in reducing mechanics for design elegance in first-person games. Designer Thomas Grip (2011) discusses decisions in first-person horror game *Amnesia: The Dark Descent* (2010) to remove failure states and reduce of game challenge, to reinvigorate exploratory horror experiences. Grip’s intent was to focus on running and hiding (rather than combat) and investigation of the explorable environment (further expanded on in Grip 2014). Coincidently, *Gone Home*’s original prototype was a modification of *Amnesia* (Vandell 2013). In addition, following the release of *Dear Esther* creators The Chinese Room developed a sequel to *Amnesia*, *Amnesia: A Machine for Pigs* (2013); an overlap in design similarities with walker titles is not coincidental.

Alternate approaches to first-person design are present in other titles, including first-person action platformer *Mirror’s Edge* (2008) which eschews a combat focus for navigation, and first-person puzzle game *Kairo* (2013) which presents a wordless environmental narrative discoverable within its explorable game world, discussed at length by Goodwin (2013). In addition, *Kairo, Amnesia: The Dark Descent, and Dear Esther*, were featured at the indie game event Notgames Fest 2011, curated by The Path and Graveyard creators, Tale of Tales (Samyn 2011; Relaxnews 2011).

Despite significant similarities in design influence, techniques, and concepts between these non-walker titles with walkers discussed, these genres do ultimately differ in focus to the walker. Most notably none strictly adhere to walker’s focus on navigation and discovery of an explorable game space, even though heavy emphasis is placed
on exploratory activities. Exploration is often activity that serves multiple gameplay purposes, such as combat, stealth, platforming, and puzzles.

In some ways, walkers such as *The Stanley Parable* when compared to puzzle game *Kairo* blur this distinction; the appeal of finding different endings in *The Stanley Parable* can be described as a puzzle-like. However, *Kairo* places specific emphasis on constraining exploratory navigation through logic-puzzle activities, which *must* be completed to advance. *The Stanley Parable* does not contain explicit puzzles and instead, navigation opportunities that lead to discoverable endings may be noticed through careful observation.

In the absence of these design considerations walkers reveal an intensification of these shared specific spatial concepts in mainstream and alternate games e.g. exploratory navigation, the arrangement and placement of discoverable information, the semiotic use of 3D architecture, and construction of environmental narrative. As an intensification of these mainstream design concepts without their gameplay context, the walker genre presents a highly alternative and arguably unique context in how such concepts may be considered when applied. However, despite shared design traits, this context reveals a tension in how the walker can be understood within popular and dominant understandings of game design.

2.3.2 Issues Surrounding the Walker

In this section I cover the popular creation of the walking simulator label, a loose categorial description of the walker genre. I discuss how this the term emerged from polarised discussion and backlash following the release of *Dear Esther* (2012), *The Stanley Parable* (2013), *Gone Home* (2013) and *Proteus* (2013), and yet socially legitimised the walker as a genre. I highlight epistemological tensions surrounding the
walker, and draw upon foundational, popular game design literature, revealing their limited usefulness to articulate and understand the genre.

**Popularisation of ‘Walking Simulator’ Term**

The emergence of the walking simulator as a term and loose categorical genre has not been thoroughly discussed within academia, like much surrounding the walker. I draw upon Gursoy’s (2013) overview of *Dear Esther*’s (2008, 2012) critical and popular reception, interviews with walker creators and critics, Killscreen Staff (2016), Jon Irwin (2017) and Katherine Cross (2016), and my own anecdotal knowledge.

The walking simulator term originated as a popular, intentionally dismissive and derogatory categorical umbrella during the period when key walker titles were released and received widespread critical attention. Although walking simulato

dos not simulate walking, ‘simulator’ was not used as a literal descriptor but instead to evoke titles considered rudimentary and boring by a vocal segment of the game-playing audience online. Simulator ironically referred to genres such as the farming simulator, popularly parodied because of their perceived mundanity. Gareth Damian Martin discusses this further: “In many ways the word simulator represents some of the worst instincts of games. Simulators make a pretence of being non-artistic, culturally benign objects. Think of ‘flight simulators,’ or ‘space simulators,’ genres where the term is used without a hint of irony” (Killscreen Staff 2016).

The walking simulator term was largely popularised on the Steam platform following the introduction of user-created categorical tags. Steam users use the feature to ‘brand’ games considered undesirable based on stylistic similarities or characteristics, excluding titles considered rudimentary, uninteresting or not fitting what the players consider a ‘game’ (Grayson 2014). Tags are algorithmically surfaced and appear on
the official store pages, legitimising their application. Dear Esther, The Stanley Parable, Proteus and Gone Home all received the walking simulator tag. Killscreen Staff (2016) describe the term as being “often applied frivolously” in popular discussions, leading to wider adoption of the term as a loose categorical umbrella.

Popular opposition and controversy tended to concern the minimal mechanics of walkers as commercial titles in comparison to other game styles and genres. As identified by Killscreen Staff, Dear Esther (2012) drew “a lot of hatred, partly because it was labelled a ‘videogame,’ and some viewed its low interactive demands as not being qualified (it has no true fail state, no ‘mechanics’ outside of walking and looking around), and partly because this type of game was being sold at a price” (Killscreen Staff 2016). Gursoy describes, within the context of Steam, how audience expectations and associated values differed dramatically to those surrounding Dear Esther’s 2008 release on modding website moddb.com, observing a difference in comments discussing skill and challenge as core to what should be considered a ‘game’ (Gursoy 2013, p.57). As walker developer Jonathan Burroughs notes, “Perhaps people are just afraid that games might stop being about fun”, indicating the perception of the walker as opposed to or as a threat to popularly accepted values in gameplay conventions and subject matter (Irwin 2017).

Backlash against walker titles demonstrates a challenging of essentialist game readings and popular orthodoxy of game values and gameplay conventions; a reaction that parallels historical pushbacks within the field. For example, walker game developer Jake Rodkin notes historic similarities to adventure game fans reacting negatively towards the emergence of 3D technologies (Irwin 2017). Summarised by Pearce (2005), the academic ludology narratology debate grappled questions of “what is a game”, concerned with divergent values derived from games. As the walker genre
eschewed existing taxonomies and presented values not considered ‘primary’ in a ‘game’ experience, it was ostracised. For these reasons that I adopt the term walker and ‘first-person walker’ rather than walking simulator, as I believe they more fairly reflect the genre.

Despite negative controversy towards the walker, this moment provides useful cultural insight in identifying the walker as a genre. Criticisms and discussions reveal a collective grouping of walker games that is not arbitrary, but by association, with focus on traits such as a shared time of release (e.g. 2011-2013), and formal and aesthetic qualities (e.g. mechanical minimalism (Keogh 2015)). Although the walking simulator name was used to collectively discredit titles it indicates a shared likeness representative of a genre, providing an additional cultural dimension my definition in 2.3.1.

Limitations in Foundational Game Design Literature

Much of the reason behind the controversies surrounding the walker lies in its atypical re-prioritising of traditional, well-established digital game design conventions. As Cross states, “[Dear Esther] made space for developers to clear all the excess and only restore those interactive bits that were truly needed, rather than assuming that a game must always have x, y, and z” (Cross 2016). Cross, and much discussion noted above, highlights what the walker is not in comparisons to other game types. Consequently, questions remain as to what the walker is, specifically if read as a designed game. To expand on this point, we may draw upon foundational, popular game design literature as a basis to establish how walkers differ from dominant, formalised, and normative design approaches.
As noted in 2.1, foundational game design theorists Salen and Zimmerman place emphasis on designed rules as a point of focus in a designed game, a “system in which players engage in an artificial conflict defined by rules, that results in a quantifiable outcome” (Salen & Zimmerman 2004, p.80). Although Salen and Zimmerman discuss rules as “never an end in itself” and “merely the means for creating play”, they are described as the “inner essence of the game” within formal understandings of game design (Salen & Zimmerman 2004, p.302). Game theorist Jesper Juul notes that goals are an implicit element of Salen and Zimmerman’s artificial conflict and quantifiable outcomes (Juul 2005). Furthermore, Juul replaces conflict within his definition of games, although emphasises outcomes as not strictly quantifiable but as felt by players:

“A game is a rule-based system with variable and quantifiable outcome, where different outcomes are assigned to different values, the player exerts effort in order to influence the outcome, the player feels attached to the outcome and the consequences of the activity are optional and negotiable.” (Juul 2005)

This distinction is discussed by theorist Markus Montola (2009), noting many definitions such as Salen and Zimmerman’s and Juul’s are largely derived from the anthropological work, and philosophical work of foundational play scholars Johan Huizinga (1949) and Roger Caillois (1961). Concepts derived are heavily informed by theories such as the magic circle, the metaphorical and indistinct boundary of game and real, and play activities that include Agon, competition; Alea, chance; Ilinx, vertigo or an altering of consciousness; Mimicry, group activities of role-play; these exist on
an axis of free play (paidia) to formal play (ludus) (Caillois 1961)\(^1\). Montola argues “it is notable that Salen and Zimmerman, and especially Juul, focus their definitions on ludus rather than paidia, stressing the role of rules in games” (Montola 2009, p.10). Furthermore, although we may identify Caillois’ (1961) four play activities in digital games, those of Agon and Alea tend to be valorised within theoretical design literature, even though others such as Ilinx are present within game experiences.

I contend such focus on games as complex or elegant rules and systems pervades much contemporary game design literature and discussion. Popular game design theorist Jesse Schell identifies mechanics, the rules that comprise a game’s design, as core to what the game “truly is”, the “interactions and relationships that remain when all of the aesthetics, technology, and story are stripped away” (Schell 2008, p.130). Schell acknowledges an interdependence in game design elements (see Schell’s Elemental Tetrad) but suggests a hierarchy; game and gameplay experiences are subservient to the mechanics.

Other popular game design theories similarly reflect this school of thought. Game design theorist Raph Koster emphasises rules and challenge as fundamental; above all other elements “games are about teaching underlying patterns and they train their players to ignore the fiction that wraps around the patterns” (Koster 2004 p.80). The “fun” in games, Koster argues, is “mentally mastering problems” within aesthetic, physical and social settings (2004, p.90).

This emphasis placed on rules and mastery similarly reflected in dominant and ubiquitous game design theories such as flow. Flow theory presents a model for an

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\(^1\) Definitions of play and game are further discussed in 3.3
optimal game experience through balancing game challenge to player abilities, derived from Mihaly Csikszentmihalyi’s *Flow: the psychology of optimal experience* (1990): a mental state of enjoyment when challenge matches a player’s skill abilities, between two opposing poles of anxiety and boredom leading to a flow state (Csikszentmihalyi 1990, p.74). Drawing upon Caillois (1961) Csikszentmihalyi argues games are particularly conducive to experiences of flow, and such flow activities can lead to “growth and discovery” (Csikszentmihalyi 1990, p.75), outlining four rules conducive to entering a flow state: 1) setting goals; 2) becoming immersed in the activity; 3) paying attention to what is happening; 4) learning to enjoy immediate experience (1990, p.210).

Within the game design field, the qualities of flow have been widely adopted and codified as a ubiquitous and normative design theory, by both design theorists and industry developers alike. For example, *Journey* (2012) and *Flow* (2006) designer Jenova Chen discusses flow theory within a game design context in his MFA thesis *Flow in Games* (Chen 2006). Chen describes flow as ideal for an enjoyable game experience, which can be optimised and sustained through maintaining a balance between player ability and challenge, using a dynamic difficulty adjustment model. Chen implemented this model in the acclaimed title *Flow* (2006), gaining industry notoriety.

Microsoft Studios user experience researcher Sean Baron adapts Csikszentmihalyi’s rules as four characteristics for game designers: 1) Have concrete goals with manageable rules; 2) Demand actions to achieve goals that fit within the person’s capabilities; 3) Have clear and timely feedback on performance and goal accomplishment; 4) Diminish extraneous distraction, thus facilitating concentration (Baron 2012). Salen & Zimmerman describe gameplay flow as state of “having control
in an uncertain situation” (2004, p.338), and maintaining a player’ flow state requires designers to balance gameplay between the poles of frustration and boredom, derived through the following prerequisites: challenging activity, clear goals, and feedback.

The ubiquity of flow theory within the game design field is criticised by Lana Polansky as an “ideological container” that evokes specific aesthetics as a “high watermark for what constitutes ‘balanced game design’” (Polansky 2015). Polansky argues flow theories psychology roots and ubiquity in game design implies an “extremely limited set of subjective experiences which are fundamentally mechanistic and affectively numb”, ostracising games whose values may lie within an art heritage of art (Polansky 2015).

“The celebrity of “flow”, among other things, in games discourse has encouraged a situation where games which are ideologically (and aesthetically) confrontational or self-aware don’t make it through any of the culture’s major value systems.” (Polansky 2015).

Although I do not wish to downplay the value of such theoretical knowledge, its prominence within the game design field, pervasiveness of rule-based focus, and the celebration of complex and elegant mechanistic design, reveals a dominant hegemony and exclusionary effect within game design discussion; not strictly suited to discussing certain genres and styles, emerging game types, and alternative, non-industry design practices e.g. DIY indie games discussed by Anna Anthropy (2012).

As I note in 2.1 walkers such as Dear Esther (2008) do blur clear distinction, by containing formalistic design elements described by Keogh as “mechanical minimalism” (Keogh 2015) and intensifies level design traits (see 2.3.1). However, the walker does not clearly adhere to or fit mechanical values and design understandings,
as preeminent elements part of their experience; hence the derogatory ostracization of the walking simulator in popular backlash.

It is important to note that within games scholarship is a diversity of knowledge and little in the way of an agreed upon taxonomical understanding, in fact, many scholars would argue against the idea of such taxonomies. For example, play philosopher Bernard Suits argues games contain broad, common threads and yet can be meaningfully defined:

“To play a game is to attempt to achieve a specific state of affairs [prelusory goal], using only means permitted by rules [lusory means], where the rules prohibit use of more efficient in favour of less efficient means [constitutive rules], and where the rules are accepted just because they make possible such activity [lusory attitude]. I also offer the following simpler and, so to speak, more portable version of the above: playing a game is the voluntary attempt to overcome unnecessary obstacles.” (Suits and Hurka 2005, p.54)

Within the game design field examples extend beyond purely digital games, for example, live action role playing, alternate reality games, and pervasive games discussed by theorist Markus Montola (2009). A pervasive game is defined as “a game that has one or more salient features that expand on the contractual magic circle of play spatially, temporally, or socially” (Montola 2009, p.12). Drawing upon Huizinga’s (1949) conceptual boundaries of play, pervasive games blur the magic circle in such a way that might combine the physical and digital space together.

I acknowledge other design work is being done within games that is often out-sized in influence. My design research focus is predominantly interested in the kinds of formal design values transmitted via higher education, through textbooks, popular game
studies, and industry events and blogs. I acknowledge I am working with specific biases in doing so, however, this thesis is not one concerned with definitions of games, nor one that seeks to define what the walker is. Instead, these normative design values provide a departure point for understanding why the walker was controversial, so we may proceed to identify a more useful design lens to investigate and understand it.

As such, the cultural backlash towards the walker is not a fault of theorists or game creators but does reveal distinct limitations in normative and codified theories; ill-equipped to understand and articulate emerging design styles or genres when applied, which often fall into debates of definition and by extension, validity of such definitions e.g. is it the walker a game and how do we define game? Although there has been a healthy critical conversation about walkers and their cultural reception, there remains a lack of suitable literature undertaking specific design analysis, to suggest characteristics and principles. This is despite a significant spatial-design overlap as discussed in 2.1 and 2.3.1. As a game design quandary, the walker reveals a gap within existing game design knowledge, which through specific investigation, may further our understanding of game design.

2.3.3 Walker Developments: 2014–2018

Despite infuriating some of the game-playing audience, the walker has continued to develop as a genre and collective style, although past its height as a popularly discussed aesthetic movement; the term walking simulator has since become accepted and in ways reclaimed despite issues discussed (see Killscreen Staff 2016; Irwin 2017). As Pinchbeck points out, despite disadvantages of the derogatory title it has given walker games a “shared identity” (Cross 2016). However, as Killscreen Staff note, this identity is elusive: “[walking simulators] could also be called ‘dramas,’

The walker has influenced dominant game genres, indicating a growing popular ubiquity towards aspects of the walker style. For example, FPS *Wolfenstein II: The New Colossus* (2017) features solitary exploration sequences reminiscent of *Gone Home* (2013). Horror title *SOMA* (2015) features a ‘safe mode’ similar to the ‘videogame tourism mods’ discussed in 2.2, allowing players to explore without having to sneak past and avoid threatening monsters. Greer (2018) discusses a recent popular trend in game players modifying existing games to be ‘stress-free’, removing combat or horror elements for a ‘no threat’ exploration experience. Although not a dominant trend within the broader game design field, these reveal a stylistic movement towards walker traits, such as the discovery of the game world as its own primary motivation and gameplay type.

Furthermore, there has been a significant diversification in types of walker and walker-like titles in the 2014-2018 period. Some walkers are more technically ambitious in both scope, production values, and budget, as studio-sized commercial titles sometimes financed by game publishers. These studio-walkers adopt narrative focus in their high fidelity, often incorporating multiple voice actors, and more detailed, denser or larger scoped game worlds. For example, *Everybody’s Gone to the Rapture* (2015) succeeds *Dear Esther* (2012) expanding upon its environmental traits and use of voice-over narration, by adopting a radio drama styled presentation within a highly detailed, vast explorable open world. *Tacoma* (2017) succeeds *Gone Home* (2013) and adopts multiple voiced characters as three-dimensional visual projections that can
be rewound and fast-forward, expanding on Gone Home’s empty and detailed domestic home within a sci-fi space station setting.

Walker-like title Firewatch (2016) features walker traits in its explorable wilderness setting but features a voiced player-character protagonist, and unseen companion who responds to player dialogue choices, reframing the experience as an interactive drama. What Remains of Edith Finch (2017) like Gone Home focuses on the exploration of a single domestic setting, but more strictly gates access to specific locations, each featuring a self-contained story; a unique drama with its own voice-cast, control scheme, and shifting player interactions and changes in perspective from first-person, on multiple occasions (see Wiltshire 2017). These studio-based titles reveal a broader change in development practices from small independent studios to ‘triple-A indie’ or ‘triple-I’ games; publisher financed titles created by studios smaller in scale and resources to those ‘Triple-A’ (Handrahan 2018).

Comparatively, less prominent walkers outside of the mainstream include DIY hobbyist and minimal budget titles developed by individual creators or small teams, often made free for download or funded through donations on website platforms including itch.io. Examples include Walking Simulator A Month Club Vol. 1 (2018), The Rapture is Here and You Will Be Forcibly Removed From Your Home (2013) Bernband (2014), Haunted Cities Volume 2 (2017), CHYRZA (2014), Fugue in Void (2018), and These Monsters (2016). These titles are significantly smaller in scope and 3D visual fidelity and are not as narratively developed or explicitly focused as Dear Esther (2012), Gone Home (2013), or The Stanley Parable (2013) e.g. none place emphasis on voice-over narration, or written text.

Street describes these titles as part of a “larger movement in game design towards quiet, contemplative, unsettling experiences made by individuals or very small groups” and as counter-cultural to larger “studio modelled walkers” (Street 2016) that adopt industry standard techniques and design conventions, such as those identified in 2.3.1. It is argued that these smaller and less mainstream walker titles take advantage of “the spatiality and availability of game engines built for first-person shooters” (Street 2016), revealing similarities in motivation and style to the counter-cultural art mods of FPS games discussed in 2.2, in repurposing and appropriating existing conventions and technologies for alternative forms of expression.

These emerging DIY walkers do however, contain a shared likeness in formal qualities previously identified in key walkers and *Dear Esther* (2008, 2012): 1) minimal mechanics; 2) spatial exploration; and 3) environmental narrative. All feature gameplay experiences that primarily focus on exploration of space to reveal an environment and discover information contained and imbued within it. These discoveries motivate further exploration. Despite deviations in recent walker developments, this shared likeness in traits suggests a collective genre that contains contemporary and historic titles. In Chapter 3 I further substantiate this discussion by
conducting a more in-depth analysis of these DIY and more mainstream recent walkers.

As a counter-point to these evolutions, some game creators have reflexively responded to the walker genre; a counter-culture to the walker’s counter-culture presenting critical arguments against their traits, including a shared adherence to mechanical minimalism. *Amnesia: The Dark Descent* (2010) and *SOMA* (2015) designer Grip critiques the walker for what he argues to be failures in engaging players in interesting or meaningful traversal. This is at the expense of an emphasis placed towards audio, such as *Dear Esther’s* orchestral music and narration, to put players into a ‘meditative state’ (Grip 2017).

Burford, designer of experimental first-person horror *Paratopic* (2018) describes the title as conceived as a direct response to perceived failures and shortcomings within the walker genre. Burford (2018) criticises walker titles as mundane, uninteresting “uneventful voyeurism”, which preference expository narrative delivery due to their reduced game mechanics. Burford argues Walkers are therefore limited in their potential to create an involving narrative and interactive player experiences, and therefore should be subverted; “I wanted to make a game that seemed like a walking sim on the surface but used its verbs to tell a story instead of exposition” (Burford 2018).

Both Burford and Grip focus on specific traits of the walker, namely the mechanistic aspects of walking as a primary form of engagement in ‘walking simulators’, at the expense of mechanical complexity or elegance. Both Burford and Grip describe this trait as uniquely defining of the genre, and a formalistic limit on potential avenues for creative expression and game experiences. However, broader developments since
2013 reveal significant cultural shifts in style and approaches within and surrounding the genre, raising question and doubt as to whether these traits can be considered strictly defining of the genre, or major determinants of their experiences. As such, a shared walker identity remains largely complex. Interviews with walker creators by Killscreen Staff (2016), Jon Irwin (2017) and Cross (2016) see walkers described as ‘wandering games’, ‘exploration games’, ‘games about the sensation of wandering’, ‘story-exploration games’, and ‘narrative games’. Proteus developer Ed Key identifies that distinctions often overlap and blur (Killscreen Staff 2016).

As a culturally defined artistic movement, the evolving walker is one example of broader complex issues within with the gameplay binary and surrounding culture. For example, in response to decentralised harassment campaigns targeting women within games development e.g. Gamergate (see Golding & Deventer 2016), popular backlash and cultural gate-keeping against emerging types of games (following the notgames manifesto (Samyn 2010), including ongoing ostracization of more experimental, art-driven, and politically motivated games that do not align with popular values of the game playing audience (e.g. Lawhead 2017; Samyn and Harvey 2015; Yang 2015) creators have questioned positioning themselves as game makers, developers, and designers. These ongoing developments within and surrounding the walker and broader games creation and design culture are deeply complicated, and fraught in rapid change.

It is clear from these discussions that within my design focus, walker games draw on, but also push back against conventions and formalistic understandings, revealing limitations and questions within existing game design knowledge. Although I have previously identified three design areas of interest informed by this – minimal mechanics, spatial exploration and environmental narrative – these tell us little about
what is distinct to the walker as a designed experience, nor suggest specific characteristics and principles that we might learn from. In light of this, I raise the following questions (see 1.2):

What gameplay experiences do walkers elicit, and how might designers understand these experiences?

What are the game design attributes that engage players to explore 3D walker environments?

2.4 Conclusion

In conclusion, I have provided an overview of the walker to provide contextual insight for my game design research, and to highlight the unique design questions the walker presents.

I have first focused on *Dear Esther* (2008, 2012, 2016), a seminal walker in popularising the genre. I have discussed its FPS modification origins and recontextualization of game technologies and design techniques, and in doing so highlight three specific design areas of interest: 1) minimal mechanics; 2) explorable space; and 3) environmental narrative. Through this discussion questions surrounding *Dear Esther* and other key walker titles have been foreshadowed.

Focusing on the three design areas of interest, I have raised relevant precursors to *Dear Esther* and key walker titles, identifying that *Dear Esther* (2008) has partly emerged from counter-cultural art modding practices that reimagine FPSs for mechanically minimal, non-violent, spatial exploration experiences. I have identified innovations in exploratory environmental narrative within the popular FPS titles and
highlighted mechanically minimal notgames, which foreshadowed cultural shifts in game-making practices and stylistic approaches predating the walker’s popularisation.

I have identified three key walker titles in addition to *Dear Esther* (2012): *Proteus* (2013), *The Stanley Parable* (2013) and *Gone Home* (2013), each released within a similar time-frame and receiving critical and popular attention. I have discussed obvious characteristics and similarities in relation to the three design areas, and through comparison, identified a shared likeness in formal and cultural traits. Using this I have constructed a preliminary definition of the walker genre; games that reduce conventional gameplay mechanics for focus on exploration and the discovery of information contained throughout a navigable 3D environment. Drawing upon more mainstream game design discussions I highlight that the walker shares similarities with mainstream concerns but intensify specific game design concepts. Walkers are identified as separate however, due to significant differences in context.

I have discussed the popular backlash in the coining of the walking simulator label, following the release of these four walkers. I highlight cultural implications of the term as an exclusionary reaction and form of cultural gate-keeping, in response to questions raised by walker titles towards a gameplay binary. I note this grouping of walker games is culturally indicative of a genre. To understand these questions, I have drawn upon foundational, popular game design theory. In doing so I have revealed a lack of usefulness in normative literature to understand walker experiences and their specific design characteristics, and a gap within theoretical game design knowledge. I have identified developments and cultural shifts in the genre and note despite a diversification in approaches these questions still remain.
Issues and questions identified in this chapter motivate my investigation of the four key walker titles in the following Chapter 3, Design Analysis. In doing so I seek to understand and highlight specific design characteristics distinct to the walker experience, so we may further our understanding of game design.
Chapter 3: Walker Analysis

3.0 Overview

This chapter is a more detailed account of a published research paper (Muscat et al. 2016) viewable in Appendix B. Parts of this chapter expand on conclusions and themes discussed.

In Chapter 2, I have identified a lack of critical design discussion and understanding regarding the walker within the field of game design. Foundational game design literature does little to explain specific characteristics of the walker and their experiences, despite their historical connections to more conventional game designs and a shared formal and cultural likeness as a genre.

In light of this I seek to address the following questions I raised in Chapter 1:

What gameplay experiences do walkers elicit, and how might designers understand these experiences?

What are the game design attributes that engage players to explore 3D walker environments?

In this chapter I investigate these questions, undertaking a qualitative analysis of four key walker titles from the formative 2012 – 2013 period discussed in 2.3: Dear Esther (2012), Proteus (2013), The Stanley Parable (2013) and Gone Home (2013).

In 3.1 I discuss the research approach in studying my captured gameplay experience of each walker game. Methods include Consalvo and Dutton’s (2006) qualitative toolkit adopted as a framework for formal categorical analysis, and close readings (Davidson 2009) for an informal interpretive and narrative reading each game.
In 3.2 I discuss four common overarching walker design themes highlighted through analysis of the gameplay experience study data. The walker themes discussed are: 1) player interaction; 2) temporal space; 3) player focus; and 4) ambiguity.

In 3.3 I discuss the theme of ambiguity further. I draw upon theories from design and game design fields to unpack its implications. I discuss the walker outside of a strictly game design context, drawing upon interaction design and play theory, and raise curiosity as a noteworthy experiential trait of walker games.

The study results informed the creation of the design project *WORLD4* in the following chapter, Chapter 4.

### 3.1 Study Approach

In 2.1 I identified limitations in foundational, popular game design literature in understanding the specific design characteristics and experiences of walker games. In this chapter I investigate how designers may understand walker experiences, and what design attributes engage players in exploration through a study of my observed walker gameplay experience in four selected walker games.

**Selection Focus**

Games selected for this study are four key walker titles previously identified in 2.1 and 2.3, *Dear Esther* (2012), *Proteus* (2013), *The Stanley Parable* (2013) and *Gone Home* (2013), credited for popularly establishing the walker as an aesthetic movement and game genre. All received critical acclaim e.g. Independent Games Festival in 2012, 2013 and 2014, all were collectively grouped in the social construction of the “walking simulator” genre. All feature noteworthy formal, design similarities within the three areas previously identified (see 2.1): 1) minimal mechanics, 2) spatial exploration, 3)
environmental narrative. As discussed in 2.3 this overall shared likeness can be identified as collective traits that were key in defining of the walker as a popular genre.

This study was conducted in 2015 and at this time I chose to focus on key historic walker titles. These four titles have remained relevant in contemporary genre discussions (e.g. Cross 2016; Killscreen Staff 2016; Irwin 2017), however, the design attributes found in this study may not necessarily speak or be fully-relevant to newer developments in the form. For example, diversification within genre discussed in 2.3 and noted by scholars and critics such as Street (2016). Through this study I intend to articulate a series of specific design principles distinct to this particular moment in time, one that made a large impact on the game design field more broadly (3.2). To better contextualise how specific (or not) these are, I will revisit design attributes found in the context of recent walker games (3.5). These will include studio developed and DIY titles from a 2014 – 2018 period.

Findings do not seek to provide an answer as to the ontological nature of the walker genre, but to advance specific design knowledge. Following this study, the project WORLD4 was designed to further investigate these findings with an intent to develop new, meaningful design insights. A proper analysis of this new wave of walker titles is outside the research scope of this dissertation, which is anchored in guiding further design investigation through an alternate practice-based method. However, comparison of attributes found in key historic walkers to more recent titles, will help understand the particular traits and design characteristics of this movement.

Below I will re-cap and summarise each key walker selected for this study:

In Dear Esther (2012) players explore an uninhabited Hebridean island, whose bleak landscape is comprised of winding pathways within natural geography, constraining
navigation and often guiding movement action towards focal points on the horizon. As players walk a monologue plays, a voice-over narration which frequently activates during the discovery of artificial objects cryptically placed throughout the environment. Voice over and environmental elements often coincide and contradict in their organization, complicating how a player may draw connections; compounded by a degree of randomness objects present and narration played. This experience suggests the game world as a more surreal landscape, a physical manifestation of a cryptic ghost-story narrative. These moments of navigation are often punctuated by a sombre orchestral score that compliments various locales: rolling hillsides, a cove of shipwrecks, a winding underground network of caves, and a candlelit coastline. To complete *Dear Esther* is to reach its final location, an omnipresent radio tower.

In *Gone Home* (2013) players explore a large family home within a 1990s period setting, left mysteriously unoccupied. The home consists of an interconnected series of rooms and hallways, networked in a rough and abstracted approximation of real-world architecture. Although many rooms can be accessed in any order, parts of the house are sectioned off until players locate perquisite keys often hidden in cupboards and draws. Each room contains various detailed 3D household objects and written notes and letters, which can be picked up, inspected, and placed. Rooms and their objects characterise the inhabitants (family members, friends, and lovers) and once investigated give rise to their interpersonal relationships. As players can access rooms in a fairly unstructured order, how players may construct an understanding of a family history has a degree of interpretation. To complete *Gone Home* is to reach the attic location, however players may resume exploration and discover elements, details, or rooms previously overlooked.
In *The Stanley Parable* (2013) players explore a surreal network of mysteriously empty office spaces that diverge into a series of branching pathways. The explorable environment is a physical, navigable abstraction of choices a player must decide upon, for example a left pathway or a right pathway, espoused by an omnipresent and disembodied voiced narrator. Unlike *Dear Esther*’s voiced monologue, the narrator is explicit in their dialogue, speaking directly to the player as they explore. Players unravel a series of cryptic and sometimes contradictory meta-narratives contained within the explorable environment. These often comment on storytelling devices, tropes, and techniques used in games, and are frequently paradoxical. Each pathway within networked world leads to its own conclusion, acting as a series of varied narrative vignettes spatially constructed though level decoration and architecture. Once a player reaches a conclusion, the game resets presenting opportunities for players to revisit locations or search for pathways undiscovered. To complete *The Stanley Parable* is to locate all endings hidden or obfuscated within the world. However certain endings can only be accessed once a player meets specific game conditions, such as having travelled down pathways in a particular order.

In *Proteus* (2013) players explore an island within the middle of an empty ocean, which aside from local wildlife is unoccupied. Island geography and layout is randomly generated upon starting the game, however specific elements remain consistent notably discoverable objects e.g. houses, tombstones, geometric idols, and trees. Unlike other walker games players have freedom of navigation and may explore in any direction. As they do so in-game time lapses from day to night and weather events e.g. shooting stars or rain may activate. In addition, the game world is characterised by an abstract and painterly, pixelated 3D style different to the higher-fidelity presentation in the other titles. There is no written text or voice acting in *Proteus*,
rather, during exploration musical notes, sound effects, and environmental animations complement player movements, creating a sense of liveliness within the environment.

Players may discover objects that can be activated at specific moments, advancing in-game time to a new weather season, changing the environment. To complete Proteus players advance seasonal time to winter and ascend into the sky, leaving the island.

Methods Adopted

My approach in analysing the design of walkers Dear Esther, Proteus, The Stanley Parable, and Gone Home, consists of two separate qualitative approaches to studying my observed gameplay experience of each, with specific focus on the areas of player interactivity and explorable game space. Each title is studied individually through both methods, and resulting data compared during analysis.

I utilised Consalvo and Dutton’s qualitative methodological toolkit (2006), a broad categorical framework of game elements, to categorise my gameplay observations. Consalvo and Dutton’s framework covers the following areas: Interaction Map – the interaction options and player choices during gameplay; Interface Study – the onscreen information provided to the player; Object Inventory – objects within the game world that may influence player interaction; and Gameplay Log – noteworthy events that transpire over the course of gameplay.

I considered the mechanics-dynamics-aesthetics (MDA) conceptual framework (Hunicke et al. 2004) to categorise gameplay observations; however, I deemed it unsuitable because of its emphasis on mechanically focused game design and existing types, styles and genres of games.

I adapted the close reading approach discussed by Davidson (2009) and Bizzocchi and Tanenbaum (2011) as an informal analytical approach. Close readings are
defined by Bizzocchi and Tanenbaum as “detailed examination, deconstruction, and analysis of a media text” which may reveal insights into the design of games and pleasures afforded by the game experience (2011, p.1). In the game studies journal *Well Played* (Davidson 2009), close reading outputs take the form of analytical essays of individual games, which parse out the meanings to be found in the experience of playing a game and reveal insights into game design and experience.

As I noted in 2.3, the walker experience does not clearly fit within more formalised understandings and definitions of games. Considering this, I adapted this approach for a more narratively focused, subjective and interpretive subjective account of my walker gameplay experience, in case a more formal analysis did not surface. I adopted player interactivity and game space areas as a lens to limit the scope of my readings.

I loosely drew upon William Huber’s matrix of spatialities in games (2009, p.373) and Jenkins’s game design as narrative architecture (2006) as additional conceptual frameworks during observation of my own gameplay. However, this resulted in too much detail and was only passingly referred to in notes during analysis.

*Study Execution*

As my first step for the study, I conducted a semi-structured play-through of each walker game. My impressions were not ‘fresh’ as I had a history with each game, having played through each at the time of their release, and having read developer blogs and discussions prior to and following their releases. I played each on my own, in individual gameplay sessions. Each was played to completion in the individual session. During each session, I recorded my gameplay experience through observational handwritten notes and by taking gameplay capture screenshots while playing. I also recorded short screen and audio clips of gameplay ‘moments’ while
playing. My observations focused on my interactivity with and exploration of the game spaces and environmental elements.

For walker games without a single or clear ending, such as *The Stanley Parable*, this required multiple play-throughs due to the multiple endings, some of which I discovered I had missed after conducting the study.

Upon finishing a gameplay session of each walker, I reflected upon my observational notes and recorded data the day after. Upon reflection, I wrote an ad hoc essay as a subjective account of my gameplay experience and personal thoughts in relation to the title, sometimes focusing on particular aspects. This resulted in my close reading accounts of my walker experiences.

Following the close readings, I conducted another semi-structured play-through of each walker game on my own, in individual gameplay sessions. In this second play-through, I recorded my gameplay experience again through handwritten note-taking and gameplay capture screenshots, focusing on elements relative to categories in Consalvo and Dutton’s framework (2006).

For Interaction Map, I noted all interactions and player choices I had while playing, such as movement controls and navigation choices e.g. choosing between multiple paths. For Interface Study, I noted all the onscreen interface information. For the Object Inventory category, I kept a list of objects observed in the game world while playing and noted their ‘uses’. For Gameplay Log, I noted events and noteworthy moments and encounters while playing, such as surprising discoveries while exploring.

Upon finishing a gameplay session of each walker, I digitally collated observational notes and grouped each per elemental category in *Microsoft Word*. Observational
notes were formatted per category in a way I deemed appropriate per section. For example, an object catalogue table that listed environmental objects and their appearance, location and use was created for the Object Inventory. For other categories such as Gameplay Log, I wrote small descriptive paragraphs condensing my observational notes. Overall, each game was played individually over multiple sessions ranging from 40 minutes to 2 hours in time.

A condensed version of these categories can be found in Appendix A.

Data Analysis

The close reading and categorical data for each walker game were informally analysed. Similarities in the data were identified, compared and contrasted between datasets produced from each walker game. During this process, I noted specific points of interest in similarities as prompts and referred back to screenshots and gameplay clips taken. I discussed these prompts with colleagues and supervisors, from which I tentatively raised four common areas of interest, with specific focus on interactive and spatial elements in relation to my gameplay experience. Following further discussions with colleagues and supervisors, analysis resulted in four design themes specific to the walker experience, which I discuss in 3.2.

To describe the results from the analysis, I referred to the literature previously cited in Chapter 2. This included Zimmerman and Salen (2004), Schell (2008), Totten (2014) and Jenkins (2006) in articulating specific interactive, spatial and narrative elements observed within each theme. In addition, I drew upon theorists such as Robert Buerkle (2008), Greg Costikyan (2013), Rudolf Kremers (2009), Craig Lindley (2005), and Gaver et al. (2004) to articulate results not covered by the previous literature.
3.2 Common Themes

Observation of my gameplay experience recordings and collated notes that made up my close reading and categorical data resulted in four common design themes specific to the walker experience: 1) Player Interactivity; 2) Temporal Space; 3) Player Focus; and 4) Ambiguity. In the next four sections, I describe each theme supported by examples from my observed gameplay experiences with each walker game.

3.2.1 Theme 1: Player Interactivity

This theme describes player interactions in the four walker games. I describe movement and view controls in relation to the game space and note similarities and differences across all four walker games.

Movement Control

In Chapter 2 core mechanics, defined by Salen and Zimmerman as the dominant collection of rules in a game (Salen & Zimmerman 2004, p.316), were identified as minimal in walker games. All use the standard first-person control WSAD and mouse inputs for movement and view interactions, mechanics clearly shared. These minimal core mechanics, when compared to other 3D first-person genres (e.g. the FPS), mean that the possibilities for player interaction during gameplay are more constrained. Movement controls fit within Salen and Zimmerman’s definition of operational rules, the “guidelines players require in order to play” (Salen & Zimmerman 2004, p.139).

For example, in each walker game studied, movement speed is fixed to a slow ‘walking’ pace. There is no ‘run’ or ‘sprint’ input (e.g. using the Shift key) to increase movement speed or acceleration. Instead, for example in Proteus, the ‘sprint’ (using the Shift key) reduces a player’s speed to a slower crawl but never a faster ‘running’
speed. Similarly, *Dear Esther*, *The Stanley Parable*, and *Gone Home* use similar gradual movement speed and key inputs. This slow movement speed can make the traversal of large areas of game space feel laborious, requiring a player’s sustained input of the W key to continuously move forwards. Through this configuration standard gameplay interactions are contextually reframed.

*Figure 4: Screenshot, Dear Esther (2012).*

A costal path stretching towards a beach, traversed at a very gradual and constrained movement speed. This extends time spent on the pathway with view directed towards the scenic horizon, spotlighted by environmental sun-shafts and distance-fog.

Keyboard control interactions in FPS games are often responsive, to enable agile movements. In walkers, movement speed has a slow acceleration curve (i.e. build-up time to reach ‘maximum speed’ from a static position). Lateral movements, often known as ‘strafing’, to dodge projectiles in FPS games are present in walkers but serve no specific purpose in a non-combative context. In each walker, ‘jump’ inputs have been removed (although only hidden in *The Stanley Parable*), preventing a player from vaulting over objects populating the environment or ‘bunny hopping’ (i.e. continuously jumping while in motion to gain momentum and speed). The ability to jump was
originally present in the *Dear Esther* (2008) modification and subsequently removed through later updates for these reasons. These modified controls alter the player experience so that the time spent in the game environment is extended, a factor relevant to the theme Temporal Space (3.2.2).

Walkers do contain their own unique additional interaction mechanics. In *Proteus* the standard ‘jump’ key (the spacebar on the keyboard) has been reconfigured as a ‘sit’ action – an option for players to adopt a stationary position for ‘relaxing’ – to simply take in the sights and sounds of the environment and watch time and weather pass. In addition, when sitting in a stationary position ambient music will play around the player, whereas while moving music ‘activates’ based on their position, following their movements. In *The Stanley Parable* if the player maintains a stationary position for too long the voiced narrator will jokingly comment or mock the players lack of activity. Narrator dialogue will often become increasingly exacerbated the longer a player remains stationary, incentivising players to remain stationary for comedic effect.

*Gone Home* uses a ‘crouch’ command via the C key to lower the player’s height and view; the player can thus inspect details hidden under furniture or tables up close which would otherwise be out of sight or reach if they were standing. This is utilised at the beginning of *Gone Home*; players must locate a key to the front door to access the house, hidden inside a cupboard under a decorative plastic duck object. In contrast to implementation in other walker games, this mechanic is more traditional, in-line with interactions in First-Person immersive simulator games discussed in Chapter 2.
Figure 5: Screenshot, Gone Home (2013).

The ‘Christmas Duck’ object inside a cupboard conceals the housekey necessary to enter the home. This moment introduces players to the ‘crouch’ command and interactions of opening doors, lifting, and placing objects. Activities of searching and investigating rooms, containers, and objects for discovery are communicated as core to the exploration experience.

In *Dear Esther* the player may ‘zoom’ their vision using the right mouse button, to see details from far away or up close when nearby. Similarly, in *Gone Home* players may zoom using the Shift key. Although these interactions that modify player view are not used predominantly, their implementation encourages players to slow down, drawing out the game pace and reducing in-game temporality, a factor relevant to the theme Temporal Space (3.2.2). In addition, these slowed interactions raise environmental details, which I discuss in the theme Player Focus (3.2.3).

**Player Avatars**

The player’s controlled in-game character acts as an interface with the game world. A large degree of what the player experiences and how they interact is through their player-character or ‘avatar’. One useful way we may think of the avatar is as a type of bridge that connects two components, the player and the diegetic world inside the
game, “divided by the screen” (Buerkle the 2008, p.277). Comparatively, we can consider the avatar as more than a transitory bridge between game world and player, instead as a more encompassing ‘perceptual extension’ that evokes Huizinga’s (1949) magic circle; informing the construction of metaphorical and indistinct boundaries between player and fictional environment. Klevjer comprehensively discusses these notions and associated phenomena of the avatar, supplying a broader definition:

“An avatar is an instrument or mechanism that defines for the participant a fictional body and mediates fictional agency; it is an embodied incarnation of the acting subject. It is dependent on the principle of the model, and acts as a dynamically reflexive prop in relation to its environment. Its capabilities and restrictions are based on the objective properties of the model, and these capabilities and restrictions define the possibility-space of the player’s fictional agency within the game. The avatar therefore defines the boundaries of embodied make-believe.” (Klevjer 2006, p.87).

The player-avatar’s interaction abilities fit with Salen and Zimmerman’s definition of operational rules, the “guidelines players require in order to play” (2004, p.139). As gameplay takes place through control of the player-character, these rules define the character’s interaction abilities (what the player can and cannot do when controlling a character within the game world). This does much to communicate the defined game experience and context of the game space.

For example, an onscreen ‘health’ indicator e.g. in First-Person Shooter *Half-Life 2* (2004), suggests the presence of danger and hostile threats within the world that may deplete it, hindering progress. Alternatively, the use of lateral ‘strafing’ movements noted in the previous section suggest interactions to dodge or circle foes. Similarly, an
absence of these in all four walker games, including reduced movement controls, do much to define how a player may interpret possible player-character interactions and consequentially, game and exploration activities.

An introductory cutscene reveals the player character Stanley in their office, however his face is withheld from view suggesting his character role as a transitory avatar for the player to inhabit.

In *Gone Home* and *The Stanley Parable* player-character avatars are narratively characterised during brief introductory sequences. Introductions create a story premise that frames a player’s gameplay interactions and the environmental context of the game world. In *The Stanley Parable* players are introduced to the player character Stanley, an animated although faceless 3D character shown through a brief cutscene. Stanley is described through voice over narration as an unremarkable office worker forced to stop their repetitive work to discover the nature of the office space. Players assume the role of Stanley at this point of discovery for the character, as curious investigators of their surroundings.
A family portrait of the Greenbriar family discoverable in the house foyer, Katlin (the player character) is pictured in the centre back.

*Gone Home* begins with audio dialogue, a recorded phone message voiced by the player-character Kaitlin Greenbriar, left for her family. When players assume control, luggage objects placed next to their starting position contain name-tags indicating player-character is indeed Katlin. Her appearance is not directly telegraphed to the player but revealed during exploration, shown through discoverable photos and family portraits from different periods. In addition, players may learn details about Katlin through finding objects and written notes, and occasional descriptive onscreen text during contextual interactions (see *Environment Manipulation*). Comparatively, in *Dear Esther* and *Proteus*, player avatars are not explicitly narratively characterised, and remain unseen throughout exploratory gameplay.

In each walker game, there is no player-character body visually represented during gameplay interactions; if a player is to look down only their surroundings are visible. A physical presence is conveyed during movement interactions through subtle audio-visual feedback, a concept found across digital game types as discussed by Swink in
Game Feel: A Game Designer's Guide to Virtual Sensation (2009). Audio effects (e.g. footsteps relative to the surface stepped on) convey human-like movement to the player. In other games e.g. First-Person Shooters a ‘head bob’ camera effect is employed to communicate momentum during sustained movement, although this is absent in the walkers studied as are other camera-manipulation effects including switching camera perspectives (first person to third person), and modifications to the player-character’s field-of-view to enhance or exaggerate an impression of movement locomotion.

Figure 8: Screenshot, Proteus (2013).

A calm and relaxing open island landscape that invites players to explore. The environment is viewed from a first-person perspective, enabling a perception of audio-visual elements and an enhanced sense of movement. A player’s presence as an avatar is felt through movement locomotion, and audio-visual feedback including changes in audio when moving near environmental objects.

In addition, player-character movement and view control are rarely lost in walkers during gameplay interactions. Exceptions include specific moments in The Stanley Parable such as having players enter a physically constraining device, and the ending of Proteus in which players gradually ascend into the sky during winter snowfall.
Uninterrupted control is often used for effect during navigation, including events (see Activated Triggers below) in the level design to surprise the player. Examples include visual changes to the environment when standing in specific locations in *Proteus*, a sudden change in scenery when falling down an underground shaft in *Dear Esther*, and player movements being commented upon by the narrator in *The Stanley Parable*.

It is also important to note, aside from *Gone Home*’s introduction player-characters remain voiceless. Despite visual and audible narrative context in *The Stanley Parable* and *Gone Home*, in all walker games the characteristics of avatars is often ambiguous and unexplained. The player-character largely remains an almost a ‘transparent’ presence as an inhabited player-character avatar in walker games, both visually and audibly, even if their movements can be ‘felt’ through audio-visual feedback and physics-based collision. As discussed in Theme 2: *Temporal Space* (3.2.2), characters are sometimes given material presence through environmental details.

More recent games including *Firewatch* (2016) have been described as a walkers (see *Killscreen* 2016; *Irwin* 2017), or walker-like e.g. *SOMA* (2015) feature player-characters as fully-voiced protagonists, with physically visible bodies: hands, legs, and torsos. Avatars in these titles are strongly characterised through audio and visuals for a more explicit and direct narrative purpose. These differences to 2012 – 2013 walkers reveal a more character-oriented and story-centred focus, and perhaps hints at an evolution or evolutionary deviation in the genre. In addition, we may trace use of more ‘transparent’ avatars in these four walker titles to historic predecessors discussed in 2.2.3. These include role-playing inspired ’immersive-sim’ games and first-person shooters e.g. *Half-Life* (1998) and *Half-Life 2* (2004) which feature a voiceless and unseen player-character in-game (although often depicted in promotional art); in these
examples avatars are largely defined through mechanical interactions and non-player character dialogue directed towards the player.

**Activated Triggers**

With fewer interactions to perform, players have little else to focus on other than the audio-visual and spatial environment, discovered through observation and navigation. During navigation movements, unseen location-based triggers are activated. These are invisible thresholds or ‘zones’ that once crossed or entered by the player change a state within the game. Triggers may also activate based on player view (through a ray-tracing technique) or based on a timer.

For example, player movement across the 3D spatial environment in *Proteus, Dear Esther (2012), Gone Home* and *The Stanley Parable* activates location-based triggers which cause a change in game-state. Changes often include events e.g. the playing of environmental animations or audio, like the voice-over monologue and orchestral score in *Dear Esther*.

In one example, in *Dear Esther* players reach the top of a rocky coastal ridgeline revealing a horizon vista, featuring a small cottage in the distance at an elevated position atop a hill, illuminated by a gap of sunlight in overcast clouds. A trigger is activated during traversal across the steep incline towards the house: the orchestral score fades in, giving the gradual ascent a sensation of emotional weight and poignancy. As players near the house another audio sequence is activated and the narrator’s monologue plays, cryptically describing domestic life between Esther and her partner.

Although it is unclear if these are activated through passable trigger volumes or timers, this sequence of triggered audio punctuates the player’s arrival, fostering an
anticipatory crescendo during navigation, specifically towards the house and summit as emotionally significant elements, characterising what would otherwise be slow and direct navigation towards an object landmark.

In this moment, when ascending the hillside, a cottage on the horizon is revealed. During this reveal the orchestral score activates punctuating discovery, likely due to an invisible trigger volume placed in the navigable pathway.

In *Proteus*, if players move in proximity to bird-like statues located on a hilltop at specific times, a sudden effect is activated. This effect causes game audio to shift and warp and environmental visuals to suddenly transform; the sky becomes a deep red while terrain and vegetation fade into a dark black. The stars above blink and grow in size and pulsate if looked at. This event contains multiple colour and animation changes, which combined, create a surreal and otherworldly moment that shocks and surprises. The suddenness of change is unexpected, particularly if these objects had been discovered earlier without trigger activation. Such a surreal and unexpected event gives the setting a darker and unsettling undertone, somewhat unusual given the seemingly innocuous and peaceful appearance of the island.
A sudden shift in visuals and audio when approaching the idol objects at night, warping the environment into an atmospherically oppressive moment.

We may understand the mechanical traits of activated triggers using Salen and Zimmerman’s definition of constitutive rules “underlying formal structures that exist ‘below the surface’ of the rules presented to players” (2004, p.139). The mechanics of triggers are not obvious but are felt during gameplay interactions.

In each walker how and when triggers activate is vague and ambiguous, as triggers are not visibly present within the game world nor is their function or output obvious. A player will not know if what has been triggered is semi-randomised nor how it is specifically activated e.g. a timing-based trigger, a trigger volume or ‘zone’ that a player may pass into, or view-based – if a player is looking at or away from a point or object. Their presence is obfuscated until the game obviously reacts (e.g. audio plays), and consequentially a player may be unaware that they are manipulating invisible game logic through their movements.
Alternatively, players may become hyper-aware towards specific types of activations. For example, in *The Stanley Parable* due to the repeating structure of environment exploration, players come to expect specific audio triggers at certain locations e.g. when reaching a set of two doors the narrator states: “Stanley walked through the left door”. Players may remember specific moments like this when triggers are activated to pick an alternative route (e.g. the opposite door to that previously chosen) or perform different actions in response e.g. standing still and not moving through a door or walking in the opposite direction. In these activities’ players try to ‘feel out’ or play with unseen but known constitutive game logic, extending into the possibility of triggers being present even if they are not, and new events not yet experienced (often a new line of dialogue from the narrator).

Both *The Stanley Parable* and *Dear Esther* play with the vagueness of trigger activation in creating player expectations towards identifying constitutive rule patterns. For example, both walkers semi-randomise activated audio at certain trigger points, although determining what is random and what is not is unclear during an initial play-through. This reveals that ‘walking’ in walkers is not as simple as core mechanics would suggest. Constitutive rules of walker gameplay reveal an underlying algorithmic complexity, indicating walkers may not be as “minimalistic” as popular discussion leads us to believe. Such complexity perhaps suggests more as to what is popularly recognised as “game mechanics” than it does describe walkers themselves.

**Environment Manipulation**

In addition to movement mechanics, some walkers feature a contextual ‘use’ or ‘touch’ mechanic so objects within the game world (e.g. in *Gone Home*) may be directly manipulated. These introduce additional opportunities for interaction and expand
player possibilities to manipulate the game world. Unlike activated triggers these are clearly telegraphed interactions for a player to perform, a core game mechanic for environment manipulation. For example, in Gone Home and The Stanley Parable a ‘use’ or touch’ input is bound to the left mouse button. This mechanic is contextual and only works in conjunction with specific in-world environmental objects; these are highlighted in Gone Home whereas in The Stanley Parable these are not.

In Gone Home players can manipulate environmental objects according to their type; for example, small objects may be picked up, inspected up close, thrown or dropped and placed in their original position, doors may be opened or shut, and lights switched on or off. Discussing how players interacted with the environment, designer Steve Gaynor notes players often kept doors open and lights on as reference points to where they had previously explored, and also individually moved objects to one location to create a collection of items (Gaynor 2014). The addition of object manipulation reveals
possibilities for players to engage in expressive gameplay behaviours, despite fairly rudimentary player-character mechanics when compared to other game genres.

Although infrequent, environment manipulation interactions are used in conjunction with activated, triggered events in Gone Home and The Stanley Parable. Gone Home includes one example: players may discover a small hidden passage containing unusual objects, including a jagged crucifix. If players turn on the light in this claustrophobic space, and attempt to explore further beyond it, the light breaks with a sudden audible pop creating a moment of surprise and unexpected tension.

In The Stanley Parable the ‘use’ interaction is less clearly specified in application. Players can only interact with a few specific objects throughout game world e.g. various large buttons, door handles, a power socket, and a computer keyboard. Some objects are clearly telegraphed as interactable and highlighted in the level design, or alternatively, are obfuscated and made unassuming, left for players to discover or
reveal through chance. This inconsistency of not knowing what can and cannot be interacted with, and what might result from an interaction – or multiple interactions, is part of The Stanley Parable’s exploratory experience and sense of discovery.

Comparatively, Dear Esther and Proteus have no contextual interactions; the player can only move, look and listen. Instead environment manipulation primarily takes form as Activated Triggers and audio-visual feedback during Player Avatar movement interactions discussed previously, and present in all four walker games. For example, in Proteus, as players move audio feedback generates or environmental animations play depending on player proximity to objects. These include musical notes and changes to background music filling the ambient soundscape, small animals that may move away or towards the player-character, or triggered events like the surreal screen effect.

Although less obvious than touch interactions, we can understand this use of responsive triggers contextualises movement as a form of environment manipulation. This suggests a blurring of operational and constitutive rules (Salen & Zimmerman 2004, p.139) across different walker games, with an effect of enriching looking and listening interactions.

**Theme 1: Summary**

In summary, theme 1: Player Interactivity describes player interactions across all four walker games, as revealed through the study. The results identify movement controls, player avatars and environment manipulation as visible interactivity characteristics across all four walker titles. Events activated by triggers that reveal hidden complexity that players may not be aware of. The looking and listening in walkers are contextualised as rich interactions heightening a particular experience of observation.
and movement. These are influenced by factors including reduced movement speed and reactive events. We can understand that these player interactivity traits in walkers may further enhance audio-visual elements as an experience, by drawing attention towards environmental surroundings, music, and spoken audio.

3.2.2 Theme 2: Temporal Space

This theme describes the experience of temporality or time during walker gameplay, as revealed in the study. I focus on a specific type of game spatial temporality, the pacing of gameplay and events during player exploration activities. This type of game temporality is referred to by Lindley as a performance-level temporal structure, the “parts of the virtual world directly experienced by the player” (Lindley 2005).

Reduced Conflicts and Obstructions

As discussed, the walker experience involves few player interactions and slow navigation movement. Furthermore, in walkers there are few event-based disruptions, obstacles or pressures to impede the player’s movement and navigation. For example, in Dear Esther movement through the game world is slow and uninterrupted. There are little to no explicit conflicts, challenges, or problems to solve in navigation, nor are there explicit goals, puzzles, effects or impediments to the player’s in-world status (e.g. health, damage, collectable items). This experience is distinctly different to those of more challenge-based or goal-oriented genres, for example, as described by Salen and Zimmerman, the carefully crafted arc of rewards and punishments as feedback to draw players in and keep them playing to reach a quantifiable outcome, a goal (2004, p.342).

Although the slowing of movement and extending of uninterrupted navigation time have been a subject of frustration for some players (see 2.3), this does much to
configure the played, exploratory walker game experience. Without conflict or obstructions that may impeded progress and must be responded to and resolved, the player can set the pace of navigation as they please, allowing for extended time spent within the game world. Without gameplay pressures and with a reduced navigation speed (see *Movement Control*), the pacing of gameplay action could be said to be reduced or ‘dulled’. Because of this, the passage of time experienced can be said to feel extended even though in-game playtime may be short. By extending time spent within the game world, the player may gradually ‘soak in’ and indulge in their environmental surroundings and the audio-visual experience.

For example, *Dear Esther* and *Proteus* prolong player movement through their outdoor game worlds, placing emphasis on the aesthetic beauty of the landscape. For example, the small cottage on the horizon in *Dear Esther* discussed in *Activated Triggers*, which, when moving towards it plays a haunting orchestral score and voiced
monologue. In *Gone Home* and *The Stanley Parable* both environments are confined interior locations without the same type beautiful landscape vistas.

As such, details are condensed within a labyrinthine environment of rooms, doorways and corridors. These environments asks the player to stop or slow down, to find points of enquiry within clutter and close detail that may surround their position. For example, sifting through the mess of a bedroom in *Gone Home*, or inspecting museum pieces in *The Stanley Parable*. Slowing down player actions intensifies the audio-visual experience as a point of interest, particularly in relation to exploratory navigation of the 3D spatial environment or game level, framing these as settings as to be taken in, and more curiously observed and inspected.

*Environmental Obstacles*

Exploration of the game world is a major source of pleasure. In other digital games like the FPS, navigation and consequently exploration often comes with risk. In walkers, exploration is largely unimpeded; exploration could be said to be more meditative as it requires little immediate, reactive actions from the player. We may draw a parallel between this and Sicart’s description of *Proteus* as an “emotional playground” (Sicart 2014, p.55) as noted in Chapter 2. Although the player may essentially ‘drift’ through the space during navigation, the 3D level geometry in walkers e.g. those identified in *Dear Esther* in 2.1, and walkers including *Gone Home* in 2.3, share much in common with game level design techniques, such as those described by level design theorist Totten (2014).

For example, in each walker 3D level geometry acts as an environmental barrier to obstruct and occlude a player’s view and guide their movements e.g. walls, boundaries, dead-ends, locked doors and enclosed rooms. These player-facing
obstructions do not create significant ‘challenges’, however, a complicating of navigation and orientation may create a sense of spatial ‘conflict’. In doing so obstacles pace and guide but slow navigation as they obstruct direct pathing and potentially cause disorientation, slowing down progression.

**Figure 14: Screenshot, Dear Esther (2012).**

An opening in the underground cave network leading towards two branching pathways. These wrap around densely clustered stalactites, joining into one. Placement of the stalactite objects occludes vision, breaking player sight-lines and obfuscating where the pathways may possibly lead.

In *Dear Esther* occlusion is frequently used to withhold horizons and obstruct clear sight-lines, raising question to what is discoverable beyond. This is most notable in the underground caves level, which makes frequent use of elevated pathways, constrained openings, and geometric features to create surprise during navigation through occluding the game space. Navigation in this environment yields a disorientating effect, evocative of Caillois’ Ilinx (1961); an experience of vertigo characterised by a sensation of disorientation.
Discussed in 2.3, game design literature tends to valorise play other activities identified by Caillois (1961) e.g. Agon and Alea, even though Ilinx can be understood to be a pleasure of digital game experiences. One possible way of framing the walker is that the genre focuses more on Ilinx, through its representation of space and exploratory navigation, than the other three types (Agon, Alea, Mimicry (Caillois 1961)). Level design lighting techniques have been used to balance an Ilinx effect for wayfinding, notably in use of contrasting point-lights.

To access the house players must first unlock the front door, the key can be found in a cupboard, under an object on the landing. Three hidden keys (including the front door’s) are discoverable in Gone Home, to access locked parts of the house, and two combination locks on storage containers may be opened.

Alternatively, in Gone Home navigation is obfuscated in similar ways to Dear Esther through the architecture of the semi-real house layout (see Gaynor and Craig 2015), which may disorientate navigation due to its dense, branching complexity. However, Gone Home also employs locked doors as obstructions to impede player navigation progress when exploring the home environment. Unlocking these doors could be
considered a ‘challenge’ obstacle, as progress is impeded or ‘gated’, like the “skill gates” described by Kremers; a level design technique that blocks players' progress until a specific action is performed (Kremers 2009, p.29). In Gone Home a key must be found to access more of the level. Gating is a classic game level design convention, used as an outstanding goal to structure and pace player progress through the game world i.e. to gain access to advance. However, in Gone Home use of this technique has significant contextual difference. Locating keys as a ‘task’ does not provide much in the way of a ‘challenge’ nor are significant obstructions in finding keys, often contained in locations with strong likelihood a player will notice (e.g. storage containers). Instead, gated access serves as a means to direct the player’s exploration and view towards environmental detail and clutter, specifically rooms, drawers or cupboards that may contain hidden or interesting objects. Gating is primarily a pacing obstacle to slow exploration. This characteristic relates to environmental ambiguity, discussed in Theme 4.

![Figure 16: Screenshot, The Stanley Parable (2013).](image)

A point of interest in the ‘museum ending’: a large board that displays the layout of the maintenance location, revealing a convergence of
diverging pathways, and possible paths a player may have not revealed. This is one of multiple examples of pathways and ending level layouts explicitly outlined within the environment.

*The Stanley Parable* also features ‘logic gating’ in having players meet specific conditions to locate or reveal pathways that may lead to different endings. For example, moving through a series of rooms in a particular order, or discovering alternative routes. Although somewhat ‘puzzle-like’ in nature, player progress is not explicitly obstructed, rather, these alternate pathways are not obvious and discovered through investigation or chance. In addition, many pathways and possible ending locations are telegraphed within the environment itself. For example, in the ‘museum’ location, players can look at points of interest including dioramas, posters, and information boards that allude to or explicitly reveal the level layout, mapping out potentially undiscovered pathways and endings.

*Proteus*’s allows players to accelerate time at specific locations to advance in-game seasons towards winter, the final season in the game. This could be classified as gating, however there are no physical obstructions involved. Instead, locating the time acceleration ‘portal’ or ‘ring’ requires time spent navigating so it may be located, and in-game time to have passed for it to be activated – one of the conditions in which it may be discovered. Like other walkers, gating in *Proteus* is a type of pacing obstacle that extends time spent in the world. Anecdotally, multiple friends and colleagues of mine were unaware that time could be accelerated and advanced, or that the game had a conclusion. The obfuscation the of the time ring, like different endings in *The Stanley Parable* reveals a blurring between more traditional challenges in games and walkers.

Because of the slow, less strenuous traversal and relatively unobstructed navigation, paced through obstacles, the player becomes an uninterrupted observer of the game
world; the environment may be better recognised within this context as being framed as an explorable setting to be charted out and understood, rather than a game playfield, action sandbox, or puzzle box.

Environmental Detail

By reducing movement pace and using obstacles to withhold the environment and slow navigation, players are guided towards the game world. These approaches heighten attention specifically to points of interest and environmental details within or outside of a player’s peripheral vision and sight-lines. In other exploratory game contexts these could potentially be more easily overlooked.

For example, in *Gone Home* domestic clutter is placed around rooms and concentrated at specific points. Through use of furniture objects and dim lighting conditions these are not easily seen when entering a room and can only be discovered through exploring the domestic clutter. Points of interest may contain multiple mundane objects combined with those with narrative insight (or objects simply interesting in their own right), requiring a degree of discerning concentration.
The living area room contains many environmental details with narrative insights, as well as more mundane objects of the period e.g. video cassette tapes. Objects in this room are clustered at specific points of interest that draw attention e.g. the mantel, a bookshelf, TV cabinet, and on the couches.

In *Dear Esther* man-made objects and natural geography are used to draw attention towards specific, often unusual environmental details in the landscape e.g. candles, discarded photographs, urns, pieces of car wreckage, even ghostly figures. For example, a shipwreck and slope in the terrain geography are environmental details used to direct player focus towards an unassuming cave opening, away from the main path. Within this cave players will encounter unusual biological diagrams painted on the rocky interior surface, an unexpected discovery at this point of exploration. At other points of exploration players may encounter similar details including other shipwrecks, and biological and circuitry diagrams; repetition creates multiple opportunities to discover details missed prior.
A wrecked boat and rocky edge draw focus towards a cave opening off the main path, that would otherwise remain easily overlooked. The cave inside features an unexpectedly high ceiling, and glowing biological diagrams, a discovery visually distinct in contrast to other details seen prior.

In *The Stanley Parable* environmental details are highly varied, often used in contrast to mundane office and warehouse surroundings (e.g. unusual brightly textured objects, large exaggerated buttons or switches, graffitied text on walls) or alternatively, are given a more mundane and unassuming appearance. For example, multiple office objects including signs and computers may contain stylistic variations that are not apparent at first, which when inspected, reveal oddities or written and visual gags.
In warehouse office location players may easily miss a sign when passing through; it does not look out of the ordinary and blends with the surrounding environmental textures. On inspection however, this detail contains a small joke and foreshadows what may be encountered ahead.

In *Proteus* players may notice details within the painterly environment, including plant-life that vary in appearance and audio feedback to those more frequent. In addition, an observant player may notice small creatures on the island, including flying and land-based birds, and crabs. These creatures move around the environment and only appear at certain times; details not easily discovered. When approached creatures often respond, moving away or emitting visual and audible feedback.
Crabs discoverable along certain points of sand on the island. When undisturbed the crabs emit murmuring audio, and when approached scuttle away, shifting audio to a higher pitch chime.

Environmental details in walkers act as their own points of interest, drawing attention towards themselves. Through environmental obstacles these may be enhanced guiding player sight-lines towards them, withheld for later discovery, or players may simply choose to ignore them when navigating. This element relates closely to Theme 3: Player Focus.

**Reduced Navigation Pacing**

As discussed in theme 1: Player Interactivity, movement speed in walker games is slowed in pacing. In a few instances a player can manipulate their speed, for example in *Dear Esther* falling down steep inclines to quickly circumnavigate or skip part of the designated path, quickly locating keys and unlocking doors in *Gone Home* to reach the conclusion, and approaching flying bugs in *Proteus*, which when contacted cause player movement to dramatically increase for a brief period. However, faster movement actions that may ‘game’ the environment are never rewarded.
In *Gone Home* and *Dear Esther* players will bypass locations and environmental details. Players rushing during navigation in *The Stanley Parable* may miss opportunities to reveal new pathways. In *Proteus* players must simply wait until the in-game time reaches a specific point, allowing time to be advanced to the next weather season. In each walker there is no ‘optimal’ way of playing, although gradual navigation and observation are encouraged or arguably enforced through interaction constraints.

Furthermore, *Activated Triggers* are often used in conjunction with slowed movement as a form of feedback to direct attention towards points of interest, to further slowdown navigation pacing. For example, *The Stanley Parable* and *Dear Esther* use voiceover and musical audio and *Gone Home* and *Proteus* use ambient audio and musical audio, all activated by player position. Each is applied at certain points in the game space, often in proximity to environmental points of interest and noteworthy details. In doing so this combination of elements encourages players to stop, listen and observe their surroundings or be drawn towards elements they might find interesting or particularly noteworthy.

The slowed pacing of the temporal game experience and emphasis on the game world encourages players to consider the game space environment not as something to be ‘overcome’ or ‘gamed’, but as a subject of interest in itself and to be enjoyed as a subject of conflict-free, sustained enquiry and thought, or even aesthetic pleasure.

**Theme 2: Summary**

In summary, Theme 2: Temporal Space describes the experience of reduced temporality during walker gameplay, as revealed through the study. The results identify a reduction in conflicts that may produce gameplay action or impede
navigation, the presence of environmental obstacles to obfuscate the game world, reducing navigation movements and disrupting orientation, environmental details to draw player attention for inspection and discovery, and a reduction in navigation pacing overall. We can understand how reduced temporality in walker games contextually reframes the game space as a level to be overcome, gamed, or comprehensibly beaten, into a subject of aesthetic pleasure, investigation and exploratory curiosity.

3.2.3 Theme 3: Player Focus

This theme describes adjustments in player focus in walker games. I describe how, through reduced player interactions and temporality, the four walker games apply focus predominantly towards the audio-visual element, notably the 3D game space.

**Minimal User Interface**

In walker games the user interface (UI) is empty, unlike other exploratory genres such as First-Person Shooters or Immersive Simulators, which display onscreen critical information such as character status and items held. The player’s vision of the game world each walker game contains little to no user interface elements onscreen, although *Gone Home* is an exception, featuring a small, unassuming ‘crosshair’ dot in the centre of the screen (an FPS UI aiming element).

In *Gone Home*, when the crosshair is placed over specific intractable environmental objects like doors, a written and contextual object description appears onscreen, denoting that the object can be ‘used’. This text may sometimes change to something more descriptive, presenting the player-character’s thoughts onscreen (see *Player Avatars*). In comparison, *The Stanley Parable* does not notify the player when
something can be ‘used’. Nonetheless, all walkers employ a sparse UI with minimal obstruction of the player’s game world view or to direct their movement and actions.

Figure 21: Screenshot, Gone Home (2013).

Descriptive text appearing over a specific object revealing the player-character’s thoughts. Note, once this toy object is picked up and its name-tag inspected, the text overlay changes to the name Steggy.

As there is very little in the way of challenge-based ‘tasks’ for the player to overcome (e.g. problem solving and strategizing, contests and mastery), there is very little information that necessitates visual representation and onscreen feedback. Furthermore, player actions that could be quantified and visually represented (e.g. environmental objects seen, steps taken, paths not taken) are not. Onscreen information, much like interaction activities, has been reduced and does not contextually frame the audio-visual world like in other game types.

Comparatively, in an FPS the player’s attention is divided between multiple sources of information onscreen. This may include in-world cosmetic details, items to collect, entities like non-playable characters, onscreen elements like their character’s status, objectives, prompts and tasks to complete; elements that frame interactions and create expectation from the environment. Navigation of the game world environment
itself also comes with risk. For an FPS player to focus entirely on the virtual environment and its details is to ignore vital conflict elements. While a shooter player must negotiate multiple points of focus, the walker player has only a few.

![Figure 22: Screenshot, Half-Life 2 (2004).](image)

Note the user interface HEALTH and AMMO readouts.

As discussed in Theme 1, the player-character ‘avatar’ features little in the way of view or camera manipulation effects. Within the game space, the player’s viewpoint does not visually depict their character’s virtual body. The first-person viewpoint is suspended at an approximately human head-height and the body underneath is entirely transparent. Looking down in-game reveals no torso or limbs, only the environment below and perhaps a drop shadow. Historically FPSs shared this technical characteristic to avoid technical complications in representing the player’s virtual body from the first-person perspective.

As noted in Theme 1, recent games described as walkers such as Firewatch (2016) (see Killscreen 2016; Irwin 2017), feature a fully depicted and highly stylised player-character body for their voiced protagonist. This perhaps indicates an even more
sharply story-focused turn in genre evolution or deviations. These and other recent developments (see 2.3) indicate different traditions of the walker and further suggests walkers within this 2012 – 2013 period as a counter-cultural move against the FPS genre, and a trend in depicting lonely and empty explorable worlds. Such decisions are also influenced by material and logistical factors, including technical complexity and scope to development resources and focus, in creating full-bodied avatars, detailed UIs, or interactable or responsive non-playable characters. These factors are highly visible across a range of smaller, avatar-less DIY walkers discussed by Street (2016) (see 3.5).

Figure 23: Screenshot, Proteus (2013).

When starting and ending gameplay in proteus, the top and bottom borders of the camera close in, giving an effect of eyelids opening when transitioning into the game world, or closing when exiting out.

Across these four walker titles an absence of UI information and a visually depicted body minimises onscreen distractions and potential interference with the audio and onscreen visual elements. This, and a reduction of interactions and slower game pace,
tune player focus towards spatial elements, notably the game world environment and its contents, whose details are often found only through close visual scrutiny.

**Points of Interest and Vistas**

Spatial elements that draw player focus include environmental details (as noted in Theme 2), which often provide narrative information. Within these details are more prominent objects can be described as points of interest, due to their unique or distinct characteristics and memorable traits that denote significance within the game world.

![Figure 24: Screenshot, Dear Esther (2012).](image)

Game world objects not only as environmental details, but as significant points of interest that allude to narrative insight. Car accident photographs and candles within a cave, arranged as a small memorial present information that corresponds with the narrator’s monologue.

For example, in *Dear Esther* these are frequently small objects, nestled within clutter or in corners of the explorable environment, most notably small candlelit vigils comprised of candles and additional objects e.g. a collection of photographs. These vigil can be found throughout *Dear Esther’s* explorable environment, often unassuming in their presence due to their reduced size. However, these points of
interest draw attention through their use of warm lighting often in contrast to the muted browns, greens and blues of the natural surroundings. The objects suggest narrative meaning; photographs in reference to the narrator’s descriptions of a car accident, Esther, or island inhabitants referenced in monologues.

Figure 25: Screenshot, Proteus (2013) (Pedercini 2017).

The animated ‘time rings’ are discoverable at specific in-game times within stone circles, a recurring point of interest on each generated island. Time accelerates to the next season when the player moves inside the circle.

As discussed in Theme 2, in The Stanley Parable potential game endings can be uncovered through interaction with less obvious but specific environmental objects, or by exposing hidden pathways. In Proteus, the animated swirling rings that advance game world time from season to season, can only be found at specific in-game times within the stone circle object. The stone circle contains distinct cultural and historical connotations as an object; pagan rituals and seasonal solstice, alluding to having spiritual significance. Players may draw connections between this and other non-naturalistic points of interest (e.g. statues and monoliths) to construct a more narrative interpretation of the island.
By tuning the player’s focus towards the game world environment and its contents through a reduced temporal pace (see Theme 2), points of interest within environmental details may become further exposed, more noticeable, and perhaps take on greater interpretive significance. Points of interest initially observed, made aware of, and understood by players to have implied relevance and importance, may be sought after as their own source of exploratory motivation e.g. in mapping the environment or to further a narrative understanding.

Figure 26: Screenshot, Gone Home (2013).

A damaged painting of the grandfather character, the family patriarch, spotlighted under dull lamp-light in the basement location. A fraught relationship between the grandfather and his son, the player-character’s father, is suggested through other discoverable objects and notes.

In Gone Home and Dear Esther, environmental details more pronounced (e.g. photos, written notes) or mundane (e.g. hair dye bottles, car parts) may take on narrative significance post-discovery, during extended periods of exploration. Players may draw connections between these and triggered audio monologues or readable diary entries.

By considering the relationship between these elements, the player, through
inquisitive thought and action, may build a more conclusive conceptual picture in understanding the various dimensions of the game's world. For example, the interconnected and woven family history imbued throughout *Gone Home*’s historic setting, or the Hebridean island as a dreamscape, a state of mind made physically manifest in *Dear Esther*. This activity is similar to the process of meaning making described by Cross (2015) as discussed in Chapter 1.

![Figure 27: Screenshot, Dear Esther (2012).](image)

A container ship wrecked and left to rust in a sunlit cove, enclosed around and framing the vessel. Note the use of colour blending and volumetric fog to create a mist effect in the background, essentially blurring the distant sea and islands, with the sky and clouds above.

In addition, the environments in each walker are designed and configured in such a way to be aesthetically interesting and indulged, which may evoke further narrative readings. *Dear Esther*, presents perfectly composed vistas for the player to stop and take in. Closed cave areas, gullies and other geographically ‘pathed’ areas use terrain as geometrical confines within the island setting, to direct line-of-sight and frame the environment beyond. *Gone Home* provides density in interconnected narrow corridors to obfuscate the contents of rooms, that when viewed are framed in doorways directing
vision towards clutter to look through. *The Stanley Parable* uses the occlusion of corridors to conceal the labyrinthine network of rooms beyond, often leading towards a unique and distinct piece of environmental architecture and decoration to narratively characterise the pathway chosen.

![Image](image.png)

*Figure 28: Screenshot, The Stanley Parable (2013).*

A massive surveillance room discoverable behind the boss’ office revealed as a revelatory moment. Many pathways in The Stanley Parable lead to unique and distinct set pieces, including locations from other games, and iconic environments such as the museum textured in white marble.

Vista reveals are often synchronised with audio tracks, such as *Dear Esther’s* orchestral score or *The Stanley Parable’s* humorous narration, *Proteus’s* changing soundscape and *Gone Home’s* quiet ambience (see Activated Triggers). Although a dedicated audio discussion is outside my focus on designed player interactions and the explorable environment, audio in each of these four walkers can be understood to play a strong role. As exemplified in *The Stanley Parable, Dear Esther, and Proteus*, audio is more than just an element to denote moments of exploration or enhance an emotional effect of visual points of interest; it is in fact a significant point of interest in
itself. It is important to note that this audio aspect, although not fully covered, may be critical to the genre but also may not be necessarily ‘designed’.

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Secret passage hidden behind a shelf, discoverable in the basement, framed through the narrow opening and hanging point-light with significant light falloff – creating a stark contrast between the lit opening and dark passage further back. This passage leads to a hidden corridor between sections of the house, providing an opportunity for players to discover more about the principle characters growing relationship.

From a static position, each walker’s environment can be viewed as still scenes; environmental vistas can act as “meditative spaces” (Totten 2014, p.248) where players may simply enjoy the pleasures of taking in scenery from different angles or look for minor details. A player may habitually take ‘screen captures’ during gameplay like an in-game photographer. In Proteus players wander through a visually abstract island environment, watching natural elements like trees animate and move accordingly, and listening to generated audio as time lapses. Although animation in Proteus evokes a sense of time and place, each walker uses its environment to instil
a sense of wonder and thought, similar to Sicart’s description of *Proteus* as an “emotional playground” (2014, p.55) as noted in Chapter 2.

The sparse UI and lack of onscreen information have players direct their focus towards the audio-visual game world environment and its contents. We can consider that, by reducing temporal pace and emphasising environmental details, the player’s walker experience becomes more investigative, thoughtful and contemplative, in which surroundings are to be interpreted, speculatively and narratively. We can draw similarities between this experience and those of personal thought and meaning making described by Sicart (2014, p.55) and Cross (2015).

**Theme 3: Summary**

In summary, Theme 3: Player Focus describes (a lack of) onscreen UI noise and information, and an emphasis on the 3D spatial game world and audio-visuals, as revealed through the walker analysis study. The results identify a minimising of onscreen information that may draw player attention away from or contextually frame the environment and its contents. The use of environmental details such as object clutter and spatial vistas draws attention towards the characteristics and quirks of the game space as a source of rich aesthetic pleasure, intrigue, and curiosity in walker games. Without supporting information, the action of looking in walkers affords players to speculate and ruminate on the often narratively malleable and interpretative environmental details and characteristics.

**3.2.4 Theme 4: Ambiguity**

This theme describes ambiguity in walker games. I discuss how ambiguity is utilised in spatial and environmental elements including level architecture, decorative and narrative elements in walker games, to develop and tantalise a sense of discovery and
the unknown. I identify that, while ambiguity is present in other types and genres of games, walkers heighten ambiguity as a primary driving force in the game experience.

Ambiguity is in itself a complex topic of discussion. For example, in The Ambiguity of Play Sutton-Smith (2001) notes play is in itself ambiguous, and sources of ambiguity in play are manifold. Sutton-Smith describes play as containing ambiguity, drawing upon Empson’s literary analysis Seven Types of Ambiguity (1966) that identifies ambiguity within poetry as multiple, paradoxical types: 1) the ambiguity of reference; 2) the ambiguity of the referent; 3) the ambiguity of intent; 4) the ambiguity of sense; 5) the ambiguity of transition; 6) the ambiguity of contradiction; 7) the ambiguity of meaning (Empson 1966). I acknowledge this broader complexity of ambiguity studies, but for now constrain my focus to more design-specific theory. Ambiguity is rarely treated as an explicit design subject or strategy for videogames even though many existing titles contain this trait; for example, critics, reviewers, and cultural commenters have written about “ambiguous” moments in games.

Outside of games, design theorists and practitioners have questioned normative design wisdom as counter-intuitive to ambiguity and highlight gaps in design research. In the broader field of design, one influential researcher on the subject of ambiguity is William Gaver who defines ambiguity as “a property of the interpretive relationship between people and artefacts” (Gaver et al. 2003). Within an interaction design context ambiguity is distinguished from related concepts such as fuzziness or inconsistency as “these are attributes of things, whereas ambiguity is an attribute of our interpretation of them” (Gaver et al. 2003, p.235).

Gaver et al. note interaction designers often consider ambiguity the “anathema in Human Computer Interaction” and work to eliminate ambiguity for an idealised sense
of usability (Gaver et al. 2003, p.233). Gaver et al. argue much design effort goes into “balancing clarity of use (making it intuitive) with richness of semiotic suggestion (making you like what it stands for). Both aspects of the design attempt to control the user’s interpretation of the product – that is, to reduce ambiguity” (Gaver et al. 2003, p.236); this is argued to be misguided, as ambiguity can be considered a powerful resource for design “that can be used to encourage close personal engagement with systems” through fostering intrigue, mystery, and delight (Gaver et al. 2003, p.233).

Although from a usability perspective ambiguity can be viewed as frustrating for users, Gaver et al. argue ambiguity compels people to “interpret situations for themselves” despite frustration, and “encourages them to start grappling conceptually with systems and their contexts” establishing a “deeper and more personal relations with the meanings offered by those systems” (Gaver et al. 2003, p.233).

These qualities of ambiguity are visible within and relevant to various types of games including the “immersive simulator” genre (see Chapter 2), although often adjacent to central gameplay activities and focal points. Although ambiguity is not explicitly stated, level design techniques used to foster exploratory activities share similarities to traits identified by Gaver et al. (2003). For example, encouraging player experimentation and investigation by providing opportunities for varied interactions, and fostering narrative readings by seeing discoverable information (see Gaynor (2013; 2014), Lee (2017), and Maurer (2017)). We can draw similarities between these design qualities and Gaver et al.’s description of ambiguity as disrupting clear interpretation, obliging “users to work out ways to make sense of the new situation” (Gaver et al. 2003, p.237).

Comparatively, within the contextual framing of the walker I have found ambiguity is prioritised and heightened in their designs. In an absence of overt mechanical
complexity and gameplay structures (see 3.2.1), I argue ambiguous elements and their interpretive qualities are prioritised as an experiential draw of walker play. For example, the use of semi-randomised voiceover audio and environmental objects in Dear Esther, described by Cross (2015) as conducive to interpretive meaning making, and Proteus’s unexplained generative island setting described by Sicart (2014) as an interpretive emotional playground. As such, I contend ambiguity in these walker games is very much part of their exploratory appeal.

We may draw a parallel between these walker qualities identified and designed ambiguity theory; to quote Gaver et al.:

This interpretative relationship is the source of ambiguity’s appeal: by thwarting easy interpretation, ambiguous situations require people to participate in making meaning. This can involve the integration of previously disconnected discourses, the projection of meaning onto an unspecified situation, or the resolution of an ethical dilemma. In each case, the artefact or situation sets the scene for meaningmaking, but doesn’t prescribe the result. (Gaver et al. 2003, p.235).

To understand designed ambiguity within a walker context we may utilise Gaver et al.’s (2003) theoretical model, which draws upon contemporary art and design practice to outline three classes of ambiguity: information, context and relationship. Within these classes Gaver et al. identify tactics for recognising ambiguity as design, also drawn upon and further discussed in Chapter 6, Design Strategies. My study results suggest each class of ambiguity features prominently within the four walker games, most notably within the design of their explorable game spaces and environmental contents.
Ambiguity of Information

Ambiguity of information “finds its source in the artefact itself” (Gaver et al. 2003, p.233) and arises in the way information is presented, and how it may frame or influence our reaction and response. This asks us to “project our expectations into an interpretation of incomplete information” (Gaver et al. 2003, p.237).

Each walker begins with an initial, preliminary question; in Dear Esther and Proteus the character’s role is abstract and undefined. Gone Home begins with a mysterious message as to the location of a missing character, Samantha. The Stanley Parable asks where Stanley’s co-workers are and what is the true nature of the world he inhabits. Many other questions towards the game world are left unexplained. Conclusions are obfuscated throughout their game worlds and audio-visual elements.

Points of interest within the game world are often sources of information that may provide potential answers or further insight.

A player’s attempt to resolve this initial ambiguity of information is a “broadly defined” goal influenced by “embedded elements” pushed forward through exploration “by the character’s movement across the map” (Jenkins 2006, p.124). Resolution in each walker hinges on players reaching a final destination (e.g. the omnipresent radio tower in Dear Esther, and attic in Gone Home) or locations (e.g. the ends of various pathways in The Stanley Parable, and time-ring locations in Proteus) within the level.
After a voice-message left by the player-character Katie, Gone Home begins with a note from the sister character Samantha pinned to the front door of the house. The content of the note is ambiguous, asking Katie (the player) not to search for her, stating “we’ll see each other again someday”.

To resolve ambiguity players must first make sense of the space in order to meaningfully engage with it; through activities concerning observation of environmental contents and composition. How this unfolds is a matter of organisation within the design of the explorable game world, including environmental geometry, architecture, and decorative aesthetic details.

We can understand ambiguity of information as a broadly defined goal closely related to ‘narrative anticipation’, defined by Costikyan as “the desire to see what comes next” (Costikyan 2013 p.94) by “keeping the player uncertain as to how the story, or play arc, of the game will evolve” (Costikyan 2013 p.95). This can be found in many styles and types of games, as discussed by Costikyan, and may motivate gameplay and exploration of the game space.
In walkers, however, due to the degree in which ambiguity is present this element of uncertainty remains. In each walker ambiguity of information is never clearly ‘resolved’ even though the game space and its contents may be ‘revealed’. For example, in *Dear Esther* and *Proteus* island settings remain ambiguous as to their nature even when a conclusion is reached.

![Screenshot, Dear Esther (2012).](image)

As players ascend towards the radio tower in Dear Esther’s final level, environmental details and the narrator’s monologue become more cryptic and ambiguous in nature, for example, biblical passages mentioned in the audio monologue are revealed in-world, painted on rock surfaces along an ascending path.

The questions posed at the beginning of *The Stanley Parable* are never clearly answered, but rather, and unwind into diverging self-contained endings that often contradict in meaning. Although *Gone Home* contains a conclusive ‘end’ gameplay resumes after, and players are left to resume interrogating remaining information and attempting to resolve ambiguity revealed during exploration, most notably the family’s extended history.
Much of this ambiguity of information manifests within the game spaces. These include points of interest, as discussed in 3.2.3, which may contain ambiguous information. For example, environmental objects, scenic vistas and triggered events are potential sources of information but are often concealed and fragmented throughout the explorable game world as things to find.

_Gone Home_ layers information through its domestic clutter, _Dear Esther_ scatters vague fragments across its vast outdoor environments; both can be easily missed. _The Stanley Parable_ alludes to divergent paths and possible outcomes through audible and visual suggestion. _Proteus_’s painterly, visually abstract game world is in a constant state of change in its shifting weather and seasons.

![Figure 32: Screenshot, The Stanley Parable (2013).](image)

The first explicitly telegraphed junction point exhibits ambiguity of information. At this moment the narrated voiceover states “Stanley walked through the left door” but the player may navigate through the left or right opening.

These are ‘evocative elements’ (Jenkins 2006, Pearce 2007) used to draw awareness towards ambiguous aspects of the information presented, and to invoke more
symbolic meanings that play on the player’s existing understanding of their surroundings, “the vernacular, the architectural; language of certain locales, established through symbol building” (Totten 2014, p.276).

*Gone Home* plays on haunted house story tradition; the setting creates a sense of mystery, intrigue and suspense through locked doors and dimly lit lights, and the foreboding note pinned to the front door – while also evoking the player’s own nostalgia or relatedness with typical domestic contents in a family home. In *Proteus* visually abstract totems and landmarks imply symbolic meaning as significant religious iconography e.g. the bird-like sculptures placed in elevated locations and complimented by their surreal effect (see *Activated Triggers*), or the stone circles that imply a paganistic rituals and include the presence of ‘time rings’ (see *Points of Interest and Vistas*).

Ambiguity of information may also suggest the presence of more unseen and concealed, offscreen and out of sight. For example, the discovery of a small, makeshift shrine, or concealed biological and circuitry diagrams in *Dear Esther* suggests the presence other hidden sights. A hidden diary or letter in drawers in *Gone Home* suggests the presence of additional relevant letters or diaries that may potentially yield further insight. Ambiguous information suggests the presence of hidden information, defined by Costikyan as a source of uncertainty utilised in a wide variety of games that may foster a desire for exploration, and such hidden information may create “known unknowns” (2013, p.92).

As noted earlier these ambiguous traits are present in other game types, however we may understand there is a significant contextual difference in walkers, rather than formal. Ambiguity in walkers is spotlighted, not contained within side stories or
adjacent to primary gameplay activities, like in “immersive simulator” games. Ambiguity in walkers is arguably the primary focal point for players throughout their walker experience, foreshadowed in the premise and integrated throughout the game world. During walker play engaging with ambiguity of information through discovery is a primary motivation for exploratory activities. This frames the broader walker game experience to seem more “ambiguous” than it might in other gameplay contexts.

![Figure 33: Screenshot, Dear Esther (2012).](image)

One of three illuminated biological diagrams hidden within a cave, discoverable off the main pathway. These diagrams can be found in multiple locations in Dear Esther, however this is the first possible encounter and allude the presence of ‘the hermit’ character mentioned on occasion within the narrator’s monologues.

In light of this, within walkers ambiguity of information can be understood as tantalising questioning and the prospect of insight. This suggests the presence of hidden information and may motivate ongoing exploration and narrative anticipation. Considering this, we can understand that ambiguity of information in walkers is often unresolvable but evocative in meaning.
Ambiguity of Context

Ambiguity of context is contained in “the sociocultural discourses that are used to interpret it [ambiguity]” (Gaver et al. 2003, p.233), and arises “not because things are unclear” but “because they may be understood in different contexts, each suggest different meanings” (Gaver et al. 2003, p.236). Marcel Duchamp’s Dadaist piece The Fountain is cited as an exemplary example. This requires an “integration of seemingly incompatible frames of reference” (Gaver et al. 2003, p.237).

Although walker game worlds can be navigated with ease (see 3.2.1), the fragmentation and distribution of information sources within the environment complicate their discovery. These pieces of information are often embedded elements (communicative environmental art “contained within the architecture itself” (Totten 2014, p.279)) and often localised points of interest within the environmental mise-en-scène “awaiting discovery” (Jenkins 2006, p.126), so their location and placement problematise how they may be viewed and interpreted.

How players encounter embedded elements can be influenced through level design. As discussed in Theme 3, walkers balance obfuscation and clear communication of in-world environmental content (e.g. embedded elements, environmental details and objects), using audio-visual events (e.g. activated triggers) and guiding or occluding game level design techniques. These include narrowing, widening, framing of the spatial dimensions and various influential level design factors (e.g. 3D models, geometry layout, colour grading and lighting (Totten 2014)).

These may do much to entice and guide player views and movements towards embedded elements, as well as misdirecting. For example, spatial ‘frames’ such as doorway openings in Gone Home and cave openings in Dear Esther (2012) direct
sight-lines towards a point of interest that may contain noteworthy embedded elements and block the periphery, concealing other embedded elements until the opening has been passed.

Through ambiguity of context, how these fragmented elements are presented is adjusted, problematising the readability of the environment and testing player awareness so they may develop an understanding. An example of ambiguity of context in the use of embedded elements includes objects used in environmental storytelling that communicate small ‘micronarrative’ vignettes.

A classic environmental storytelling micronarrative vignette game example is described by Totten: in a small room, on a table, is an abandoned gun half-filled with ammunition, some bullets scattered on the floor. Under an overturned chair next to the table is a smeared path of blood that leads into a doorway, lit up by a spotlight (Totten 2014, p.283). Although no words have been said, the player can quickly interpret obvious connections between elements and conceive an idea of what might have happened.
A red hair-dye bottle in the upstairs bathroom used by Samantha. Note from the doorway the bottle is obscured but the dye splatter is visible; the player is initially misdirected to assume the splatter is blood.

In *Gone Home* a similar environmental storytelling approach in micronarrative vignettes is present but utilises an ambiguity of context. From a bathroom doorway, what looks like blood can be seen smeared on a bathtub. On closer investigation, a red hair-dye bottle can be found concealed between shelves and the tub, obscured from the doorway view. The player is initially misdirected to believe that a violent act has happened; finding the bottle reframes what would be a classic murder mystery styled vignette. Through ambiguity of context this scene can be read in multiple ways, subverting the player’s initial expectations.

In *Dear Esther*, due to the vague, ambiguous and contradictory nature of much information presented in monologues and points of interest, the island itself takes on an ambiguous context over the course of exploration. Ambiguity of context raises question to the setting as real-world, an ethereal and otherworldly place, or a psychological dreamscape made manifest.
Car wreckage on an underwater highway that players may move towards, encountered through a vertical drop into water within the cave network. This environment fades out and transitions back to the watery cave after a specific amount of time has passed.

In *Dear Esther* this environmental ambiguity of context is made more prominent during a sudden transition between locations: Within the cave network location players fall down a vertical shaft into water below, and at the moment of impact the murky waters transform into a desolate underwater British highway, featuring a wrecked car (with lights still active) on the horizon. A car accident is a recurring theme in the narrator’s monologues and suggested through discoverable objects including car parts and x-ray photographs. This ambiguity of context reframes the environment, a realistically-rendered Hebridean island supposedly grounded in reality, as a lucid dreamscape of a possibly broken psyche, blurring past events both traumatic and fondly remembered.

In *The Stanley Parable*, ambiguity of context is frequently employed to create moments of surprise and questioning within the recurring game level structure. The end of each pathway resets players back to the starting office location. With each reset players become accustomed to environment characteristics and sensitised towards
noticing differences. In one random occurrence a large amount of printed paper can be found outside of the starting office, littering the floor and leading further into the network of corridors. This moment is surprising, creating an expectation of an event to play out, but nothing changes and there is no other form of acknowledgement. This ambiguity of context leaves players to question what is happening; whether or not they should expect further subversion, or if this is in itself the subversion, raising further question towards the overall nature of the game world as inherently unstable in material form.

Figure 36: Screenshot, The Stanley Parable (2013).

The exit doorway from Stanley’s office, no.427, leading into a series of cubicles and office spaces beyond; a usually clean and characterless mundane setting. Seemingly at random the floor is littered with printed paper, which is never explained or referenced at any point.

In addition, *The Stanley Parable* employs ambiguity of context in other instances, including locations previously explored taking on surreal changes in appearance when revisited e.g. ‘broken’ or glitching surface textures and 3D objects crushed and embedded within floors and walls.
In *Proteus*, weather and seasons changes modify the appearance of natural vegetation and ambient audio, taking on significantly different atmosphere and tone. Some of these changes in weather create an ambiguity of context as to the nature of the island. For example, in one instance island weather changes to a dreamlike state, different to other seasonal conditions. The island visually changes, featuring a colour pallet switch to a violet hue covering most surfaces and a dull fog that muddies object forms, blending and reducing environmental contrast. This moment is unexplained and distinctly different to expected seasons (e.g. summer, autumn, winter, spring), raising question towards the island as grounded in a relatable reality e.g. predictable and familiar cyclical weather patterns and seasons.

![Figure 37: Screenshot, Proteus (2013).](image)

A change in weather revealing the island as a more surreal and dream-like game world, characterised by dense low clouds, trees without leaves, a blending of violet, blue and yellow colours on the ground, in the clouds, and misty distance fog.

Through ambiguity of context, how game world elements including points of interest may be discovered is fragmented and made more uncertain, until additional context is exposed through further scrutiny. This uncertainty may be loosely described as a kind
of solver’s uncertainty, defined by Costikyan as a type of uncertainty “caused by the challenge of puzzles in a game” (Costikyan 2013, p.25). Within this context this uncertainty cannot be strictly ‘solved’ like a logic puzzle, however the revealing of contextual ambiguity could be described as a type of ‘investigative’ exploration to resolve uncertainty.

Consequently, the obfuscation that ambiguity of context provides reframes navigation as a process of discovery. As the player spends time exploring the game world, they develop a more attuned literacy in identifying and understanding these elements and interpreting their in-world context. Constructing an understanding of contextual ambiguity during walker play is very much part of the game experience, contextually different to other genres that place contextual ambiguity within the periphery. For example, in FPS *Half-Life 2* there is a clear distinction between elements imbued with a quantifiable significance (e.g. health and ammo pick-ups) for the purposes of challenge gameplay, those plot relevant in information, and those decorative. Over time as a player reveals the extent of contextual ambiguity, overall ambiguity of information may be influenced.

**Ambiguity of Relationship**

Ambiguity of relationship is in the “interpretive and evaluative stance of the individual” (Gaver et al. 2003, p.233) and “arises from the viewer’s personal relationship with the piece” (Gaver et al. 2003, p.237). This produces a sort of self-examination, pushing us to imagine how we might personally engage and what would be the consequence. We may speculate and form “intellectual, aesthetic, emotional, and moral judgements” that “evokes a projection of our subjective experiences and attitudes onto new situations” (Gaver et al. 2003, p.237).
Each walker in their own ways, features a deeply relatable setting. *Gone Home* has us examine a domestic household that draws parallels with our own nostalgia and family memories. *The Stanley Parable* draws on familiar iconography of bureaucracy in its mundane office cubicles. *Proteus* and *Dear Esther* draw on our experiences taking nature walks or hiking along the coast. Furthermore, this relatedness extends thematically e.g. by allowing the player to subvert the narrator’s voiceover narration, *The Stanley Parable* asks us to question why we find game and narrative conventions so compelling.

As discussed, discovering and interpreting fragmented points of interest and information throughout the game world, are key to how the player can develop an understanding of ambiguous information. The restrictive nature of the first-person view and control and obfuscated in-world game elements problematises how easily and efficiently the player may interpret and conclude as to the relationship game elements. With no method for recording findings in-game (*Gone Home*’s plot-relevant diary entries the exception), players must mentally store information found or record their own notes.

The time spent slowly navigating through the game world (see Theme 2: Temporal Space) becomes time for contemplative thought and speculation as to the relevance of audio-visual elements, most notably points of interest and environmental details (see Theme 3: Player Focus). Each new point of focus serves as a piece of additional information that may be added to the player’s mental map. In their totality, the player may build a more conclusive or comprehensive picture as to their relationship and significance within a combined narrative context.
The dining area location accessible towards the end of the game, can be explored to reveal details chronologically recent to when the game begins, allowing players to draw connections to earlier discoveries. Insights include different objects and tense notes that highlight the growing separation between Samantha and her parents, analogous to Katie’s (the player-character) model behaviour revealed through written postcards displayed around the room.

For example, in *Gone Home* information is concealed through many different environmental layers: written notes and letters, objects that can be picked up, containers, room arrangement, and the layout of the house. As these are revealed, so too are potential connections. Once reflected upon players may build a more cohesive understanding of their purpose and narrative significance. However, many of these connections have gaps and may be missed e.g. the father’s fraught relationship with his own father, the mother’s career successes, or the Greenbriar family’s emigration to the United States. Discoveries provide enough insight to support and encourage a subjective interpretation to fill gaps.
A chemical diagram hidden within an abandoned building, one of the first of many throughout the game world. This diagram, like many other in-world elements, is never fully explained but implied to be of significance due to its recurring presence and obscure placement.

In *Dear Esther* environmental points of interest vary: a gaping chasm; shipwrecks; an abandoned cottage; circuitry and biological diagrams; pieces of a wrecked car; and smaller game world objects – notes, photographs, and seagull eggs. Their meanings are nebulous, compounded by the narrator’s vague, semi-randomised monologues. How these relate contradicts and confuses, complicating a cohesive interpretation. The significance of elements such as diagram graffiti is implied and suggested through their contrast to the more mundane geographic surroundings, unassuming or prominent placement within the environment, and repetitive use. Even though the meaning of these elements remains ambiguous, these gesture towards a purpose and significance within a combined context, encouraging players to derive an interpretation.
A bending tunnel with a gradual incline within the cave network lined with chemical and circuitry diagrams graffitied in luminescent paint. When first encountered the tunnel begins with a biblical quote referencing the city of Damascus painted on the wall, and a haunting audio cue that plays as the pathway is navigated. Although players may not be fully privy to the presence of such diagrams prior, the composition of these environmental details and level architecture instil an almost religious fervour in their significance, raising further question to their relationship with the island and characters referenced by the narrator.

We may characterise this activity as sharing loose, tangential similarities with solver’s uncertainty, previously identified as being “caused by the challenge of puzzles in a game” (Costikyan 2013, p.25). This is description is not entirely accurate however, as the ambiguity resists the idea of clear “solving” or “solutions”. Instead this activity relates more to narrative comprehension, described by Jenkins as an “active process” by which viewers “assemble and make hypotheses about likely narrative developments on the basis of information drawn from textual cues and clues” (Jenkins 2006, p.126).

However, these walker games do not exist to be “solved” and instead resist clear definitive meaning. Possible interpretations are informed and guided by numerous factors e.g. game level layout, placement and distribution of information through
environmental, audio-visual and interactive elements, but interpretation is not explicitly directed, demanded or even expected from the player during walker play. Furthermore, without recording abilities players must subjectivity internalise links between elements to make sense of the game world.

We can relate this ambiguity of relationship within these walker games to Cross’s description of a “meaning-making process” in *Dear Esther* as part of an adventure of “constructing and reconstructing a character”, impressed rather than clearly defined (Cross 2015). Gaver et al. similarly describe an experience of participatory meaning making within the context of ambiguity as a “projection of meaning onto an unspecified situation” (Gaver et al. 2003, p.235). It is within an ambiguity of relationship walkers resist a “gamed” solution and create space for subjective readings and hypothesised connections. These walker games perhaps suggest a trend at this moment in time (2012 – 2013) in pushing back against the idea that their meanings even need to be pieced together or solved (although *Gone Home* is the more traditional than the other three).

For example, *Dear Esther* has had many interpretive readings in online forums and online articles. Although many fans attempt to “solve” its meaning, it is ultimately fruitless due to the degree in which ambiguity is present (noted by Goodwin 2012). Instead players are left to deliberate these gaps, one such example includes Swain (2012). We may also relate this to Sicart’s description of *Proteus* as an emotional playground for subjective thought, which we can understand as highly ambiguous in its overall presentation (Sicart 2014, p.55), and *The Stanley Parable*’s many paradoxical and contradictory meanings. Comparatively *Gone Home* does not emphasise this ambiguous trait as significantly as many meanings can be “solved”
similar to more traditional “immersive simulator” games, but these are numerous, layered, and can easily be missed.

As ambiguity cannot be pieced together, solved, or entirely resolved, we may begin to understand exploration within walker play as an activity characterised by forming an interpretive mental map. This mental map does not only include a ‘mapping’ of the navigable game world, but the subjective connections derived from it. Ambiguity of relationship provides a negative space for interpretive readings, and importantly, speculative imagination that encourages deeper and more personal thought towards game world meanings, as part of the overall exploratory walker experience.

Theme 4: Summary

In summary, theme 4: Ambiguity describes three categories of ambiguity, as revealed through the walker analysis study. Ambiguity of information is revealed as creating questions around the nature of the game world, motivating exploration by suggesting hidden information. Ambiguity of context is revealed as the obfuscation and reframing of environmental elements whose meaning changes as context is revealed, enhancing exploratory navigation as a process of discovery. Ambiguity of relationship is revealed in the interpretive gap between combined game elements, most notably those discoverable within the environment, which provides space for subjective connections and interpretative readings on reflection.

Table 1 summarises the four themes:
<table>
<thead>
<tr>
<th>Theme</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Player</td>
<td>This theme describes elements of interactivity within walker games. These include limited movement control, a slower movement pace and activated</td>
</tr>
<tr>
<td>Interactivity</td>
<td>triggers, which indicate an unseen complexity in ‘walking’.</td>
</tr>
<tr>
<td>Temporal</td>
<td>This theme describes elements that effect in-game temporality within walker games. These include the reduction of conflicts and obstructions,</td>
</tr>
<tr>
<td>Space</td>
<td>and the application of environmental obstacles and detail to slow movement and reduce navigation pacing.</td>
</tr>
<tr>
<td>Player Focus</td>
<td>This theme describes elements that affect player focus within walker games. These include a minimising of user interface information, and the</td>
</tr>
<tr>
<td></td>
<td>application of environmental detail and vistas to implicitly guide player attention from interaction towards the audio-visual.</td>
</tr>
<tr>
<td>Ambiguity</td>
<td>This theme describes elements of ambiguity within walker games. These include three types of ambiguity: ambiguity of information that suggests</td>
</tr>
<tr>
<td></td>
<td>hidden information; ambiguity of context within embedded environmental objects whose meanings change; and ambiguity of relationship in environmental</td>
</tr>
<tr>
<td></td>
<td>elements that fosters interpretation and subjective readings.</td>
</tr>
</tbody>
</table>
3.3 Discussion of Findings: Understanding Ambiguity within Game Design

After revealing the four themes of walker design I have chosen to focus on the trait of ambiguity within my investigation. In this section I expand on my findings to interrogate the theme of designed ambiguity within a walker context and look abroad to interaction design practices and curiosity research.

3.3.1 Interrogating Ambiguity in Walkers

As we try to further examine ambiguity in walkers, let’s revisit my study results. We can understand the following: walker games re-contextualise more conventional game design elements for an alternative exploratory game experience. Through minimising player interactions to a select few, limiting movement speed to a slow pace and removing almost all UI elements, the player’s attention is implicitly directed away from interaction elements towards the audio-visual.

These audio-visual elements, most notably those visible within the game world like the spatial environment, are heightened as noteworthy focal points. Reduced game mechanics and minimal player interactions serve as a contextual frame for how players may view, and consequentially understand the game world. These overarching design characteristics frame the player’s walker experience as something not to be overcome, but one of keen perception and close enquiry.

We can understand that these characteristics heighten aspects of designed ambiguity within these walkers as focal points. My results suggest that ambiguity may be understood as a key underlying design characteristic in shaping the walker experience that plays upon the perceptual limitations of the first-person view, slowed pace and
focus on the audio-visual. Three categories of designed ambiguity are identified in walkers: information, context and relationship:

Ambiguous elements are evocative and mysterious; they cannot be strictly ‘solved’, nor are there clearly discernible ‘conflicts’, explicit feedback or quantifiable outcomes associated. Although movement and observation interaction mechanics are paramount to the game experience, these are a means to reveal the extent of ambiguity through exploration and to enable close comprehension, as there is no assistance in finding a ‘correct’ resolution or understanding. With no in-game method for recording findings, the player must rely on their own mental recollection or written notes. Through these design choices, subjective, interpretive readings of game world elements are encouraged as part of the exploration experience.

In light of this, walker gameplay can be identified as a combination of both speculative thoughts and exploratory interactions with an ambiguous environment.

With this knowledge, we understand that the walker falls between definitions of what has classically been defined as game and play (e.g. Salen, Zimmerman 2004, p.342). All walkers contain formal designed rules; operational, evident in their use of core interaction mechanics, and constitutive, evident in hidden rules in activated triggers. These rules define activities like navigation, doing much to frame what the walker may afford as a game experience, such as exploration. In a strict sense the walker experience does feature a variety of gameplay, a “formalised interaction that occurs when players follow the rules of the game and experience the system through play” (Salen & Zimmerman 2004, p.342). Furthermore, artificial conflicts and quantifiable outcomes could be argued to be present, such as the negotiation of game space boundaries and obstructions, reaching an ending location.
However, although these formalistic traits are present within each walker game, these do little to account for or explain other characteristics determinant of walker play experiences, including reduced temporality and ambiguity. For example, I have identified interpretive meaning making and mapping as a significant experiential element within walker gameplay. This is not a formalised interaction that fits within Salen and Zimmerman’s model. Ultimately, although formal game design traits are present in walkers and overlap with existing game types, this contextual divergence revealed in my findings indicates a limitation in formalised game design models to capture and articulate these design characteristics.

In this sense it is useful to think of walkers, momentarily, as designed play rather than designed games. As noted in 2.3.3 the binary around game and play definitions is deeply complex and embedded within a broader sociocultural discussion, historically fraught. Much of this discussion is platform holder and community based, and often political, such as the broadening of game definitions to afford visibility or cultural gatekeeping to ostracise of emerging genres and creative practices. Consequentially many creators are sceptical in identifying with game labels and question positioning themselves (see Lawhead 2017; Samyn and Harvey 2015; Yang 2015). These complexities are well outside of the scope and focus of this research, but I acknowledge the design literature I draw upon is involved within this broader context and influenced by these sociocultural factors.

Within a foundational game design context, play as defined by Salen and Zimmerman is “free movement within a more rigid structure” (2004, p.305), drawing heavily upon Caillois’ (1961) classification of play as rule-bound (ludus) or free-form (paidia) (2004, p.307). Salen and Zimmerman also note that play itself is historically “highly resistant to formalized understanding” (Salen & Zimmerman 2004, p.4). In comparison,
Fullerton draws upon Caillois to describe play more structurally as a “key dramatic element that engages players emotionally in games” that presents opportunities for emergent experiences and for personal expression (Fullerton 2014, p.201).

Flanagan (2009) discusses a separation between the notions of ‘game’ and ‘play; play is defined as open ended and “goal-less” while games are argued to have more structure, including concrete outcomes such as winning and losing (which may be muddied through subversive “playful aesthetics”) (Flanagan 2015, p.262). Deterding et al. also argue that there is a distinction between games and play, linked to Caillois’ concept of paidia and ludus as two poles of play activities: “Whereas paidia and ludus denotes a more free-form, expressive, improvisational, even ‘tumultuous’ recombination of behaviours and meanings, ludus (or ‘gaming’) captures playing structured by rules and competitive strife toward goals” (Deterding et al. 2011).

By these definitions, we can understand that formal rule-based structures partially determine the designed walker experience, but much of walker play is beyond these within readings and interpretations of ambiguous elements. This kind of walker play can be understood to be, simultaneously, an exploration of the game space and mental-mapping of environmental content. walker play is largely transformative of the more rigid navigation ‘game’ experience, as more free-form, open-ended and perhaps ‘playful’ experiences.

We can expand on this particular understanding by discussing walkers as ‘playful’ experiences, using Sicart’s distinction: The “main difference between play and playfulness” is that play is an activity (“a coherent and finite set of actions performed for certain purposes”) while playfulness is an attitude (“a stance toward and activity” i.e. emotional or physical) (Sicart 2014, p.18).
Parallels between this distinction and my findings from studying four walker games can be made within Sicart's description of *Proteus*, as an unstructured and freely roamed play space (rather than game space) that invites players “to enter a state in which we become the subject of experience and inquiry” by not concentrating on the designed environmental props, but our own “emotional props” (Sicart 2014, p.55). *Proteus* exemplifies what Sicart defines as an “emotional playground … spaces designed for using the experience of play rather than its form to create emotions” (Sicart 2014, p.55).

The experience described by Sicart shares similarities with Cross’s description of a meaning-making process in *Dear Esther*. Cross describes gameplay in *Dear Esther* as part of an adventure in “constructing and reconstructing a character” (Cross 2015). We may similarly describe *Dear Esther* as an emotional playground, containing emotional props with an evocative but vague narrative significance, that encourages players to form a subjective mental map in order to understand their ambiguous relationship. These correlate with Gaver et al.’s description of participatory meaning making as a projection of meaning when engaging with ambiguity, which encourages people establish deeper and more personal relations with the meanings offered by those systems, (Gaver et al. 2003, p.235).

Furthermore, we may highlight a connection between play and ambiguity through Sutton-Smith who although does not discuss ambiguity as an experience of play, describes play itself as inherently ambiguous in meaning and thus various forms of play are subject to interpretive, ideological rhetorics (Sutton-Smith 2001, p.2).
In summary, we understand that a walker is played; we wish to explore, discover and understand their environments. But walkers resist being ‘gamed’; they are interpreted, as their ambiguity is not quantifiable and often not conclusive.

But what does this mean for walker design within a game design context? My results indicate that walkers are indeed distinct from common forms of digital games as defined by Salen and Zimmerman (2004). Although many game design traits are identifiable, walkers do not entirely fit within formal, foundational definitions and game design values. This indicates two possible explanations: common definitions of game as design are restrictive and must be expanded; or the walker lies outside of any clear definition.

In light of this discussion surrounding the trait of ambiguity, I want to expand on this and the notion of the walker as a more ‘play’ or ‘playful’ design by drawing upon relevant design theory from other design research fields so that we may better articulate walker traits within a design context.

3.3.2 Understanding Walkers as Played and Gamed

To begin, contemporary distinctions of game and play are largely derived from Johan Huizinga’s seminal work *Homo Ludens* (1949), in which ludus (meaning of or relating to play) is discussed at length, defined as the following:

“Summing up the formal characteristics of play we might call it a free activity standing quite consciously outside “ordinary” life as being “not serious,” but at the same time absorbing the player intensely and utterly. It is an activity connected with no material interest, and no profit can be gained by it. It proceeds within its own proper boundaries of time and space according to fixed rules and in an orderly manner. It promotes the formation of social groupings
which tend to surround themselves with secrecy and to stress their difference from the common world by disguise or other means.” (Huizinga 1949, p.13)

In *Homo Ludens* Huizinga (1949) demarcates play from games and other activities, and as noted by Rodger Caillois in *Man, Play, and Games* (1961). Caillois responds to Huizinga’s definition by broadening it, distinguishing play is an activity best defined by six essential characteristics; play is: free; separate; uncertain; unproductive; governed by rules; make-believe (Caillois 1961, p.9). Caillois argues that although Huizinga defines play as action without material interest and as separate to games of chance, games are in-fact within the domain of play, which may contain one or multiple categories of four play forms: Agon, competition; Alea, chance; Mimicry, simulation; Illinx, vertigo (1961, p.11). Forms of play are distinguished as existing on a continuum between two poles of unstructured and structured activities, paidia and ludus:

“Such a primary power of improvisation and joy, which I call paidia [child], is allied to the taste for gratuitous difficulty that I propose to call ludus, in order to encompass the various games to which, without exaggeration, a civilizing quality can be attributed.” (Caillois 1961, p.27)

As games they may contain multiple forms of play, the complex and multifaceted relationship between games and play in various cultural forms is discussed at length by Caillois, often reforming when enacted; an establishment of rules may tend towards turning paidia to ludus, however, rules are subject to the influence of paidia.

Drawing upon Huizinga and Caillois, Salen and Zimmerman identify the relationship between games and play as being structured in two possible ways: games are a subset of play, and play is an element of games (Salen & Zimmerman 2004, p.303). Play itself is discussed as manifesting as three categories: gameplay; ludic activities;
and being playful. Gameplay is the formalised interaction that occurs when players follow the rules of the game and experience the system through play. Gameplay is described as a subset of ludic activities, a “special kind of formalized ludic activity” which include games and non-game behaviours, and ludic activities as “formalized, literal ways of being playful” (Salen & Zimmerman 2004, p.303).

Salen and Zimmerman adopt their distinctions to define ludic activities within gameplay as being closer to the “play of games” but include non-game behaviours we also think of as “playing” (Salen & Zimmerman 2004, p.308). We can utilise this definition of ludic activities to describe the walker as being between dimensions of gameplay and being playful; it contains formalised gameplay interactions yet lends itself to more free-form play in open-ended play through ambiguous interpretation of the explorable game world, which emerges within its more rigid mechanical structure.

Within game design we tend to think about these distinctions between play and game in a more utilitarian fashion. As an opportunity to self-reflect we can look abroad, outside of games, and learn from other burgeoning design disciplines that have started to grapple with these concepts of play and games. In some ways this topic is a more controversial design discussion in these fields. Within interaction design research Sengers and Gaver (2006) have questioned whether design can learn from play, and if experiences of curiosity and reflection can be designed for, grappling with the self-described notion of ‘ludic design’.

Sengers and William describe ludic design as a form of design that draws on critiques of utility that designers unconsciously design systems for, overlooking values of curiosity, play, exploration and reflection (Sengers & Gaver 2006, p.3). Gaver et al. introduce ludic design as seeking to offer “a range of possible actions and meanings
for people to explore” which must “leave ample room for different interpretations and uses” without imposing a “correct” way of use (Gaver et al. 2004). More broadly, Deterding et al. describe “ludic design”, “ludic engagement” and “ludic activities” as “activities motivated by curiosity, exploration, and reflection” (Deterding et al. 2011).

One such example includes the Drift Table, a self-described design for ludic engagement discussed by Gaver et al. (2004). The Drift Table is an electronic coffee table that displays slowly moving aerial photography, which can be manipulated through weight distribution on the surface. Gaver et al. describe this technology as de-emphasising “the pursuit of external goals” and “maintain[ing] openness and ambiguity” to foster an experience of intrigue and curiosity (Gaver et al. 2004).

We can draw parallels between these ludic design concepts and walker games, notably their de-emphasis of goals, interpretive openness and ambiguity. Furthermore, tactics for ludic design discussed by Gaver et al. share similarities with walker design. For example, presenting “a range of possibilities for people to explore” by not seeking “to meet the users’ immediate desires” (Gaver et al. 2004) can be compared to the scarcity of interaction and reduced temporality in walkers in order to draw the user into audio-visual elements and raise interpretive ambiguity during exploration.

Furthermore, we can draw additional parallels between why walkers abandoned many traditional videogame structures, to Gaver’s expressed belief that games “have too many rules and too much competition” and are “too channelled and goal directed-designed” to “lend themselves to ludic engagement” (Gaver 2015). Independent to interaction design researchers, walker designers have reached a similar conclusion: the need to strip away directed interactions and gameplay structures, to open up a space for reflection and interpretation. Within this context I argue walkers lend
themselves to this idea of ludic engagement and design. Therefore, to discuss the walker as a designed game, a more suitable definition for “game design” is perhaps necessary that more accurately speaks to their design characteristics and values.

Drawing upon Sicart (2014) once again, we can consider game design in closer terms to ludic design (Gaver et al. 2004; Gaver 2015); the design of games is “a type of emotional design in which the creation of artificial obstacles enhances emotions through play” (Sicart 2014 p.89). The designed game is a prop, a system which contains “partial meaning”, as “meaning is created through an activity that is contextual, appropriative, creative, disruptive, and deeply personal” (Sicart 2014 p.87).

Utilising this definition, walker design is primarily concerned with the creation of ambiguous elements contained within the game space and in related systems (e.g. dialogue and audio triggers), emphasised through a reduction of systems (core mechanics) and onscreen information. Meaning in walker play is derived through navigation and revealing of such elements. It is important to note that this is not a conclusive definition of walkers as design, but instead to understand and discuss walkers as design for game design knowledge.

If walkers are understood to be played and not “gamed” in respect to their ambiguous traits as unquantifiable, we understand that walker design concerns the design of exploratory navigation that gradually exposes ambiguity; through the limitations of first-person observation and movement, the walker taps into our innate desire to explore and discover.

In reflecting upon this, I have come to understand that, through design characteristics that de-emphasise external goals and emphasise interpretive openness and ambiguity, an experience of curiosity emerges. Such an experience may describe the
qualities of both instinctive, self-directed play as described by Sicart (2014) and meaning making as described by Cross (2015). Furthermore, an experience of curiosity is described as emerging or manifesting through ludic activities. Gaver et al. (2004), Gaver (2006, 2015) and Deterding et al. (2011) all identify that ludic designs are conducive to fostering experiences of curiosity.

Walker design characteristics configure first-person exploration into an experience that is best defined as a curious one; walkers cannot be mastered, but we still wish to understand them.

In light of these findings, in the following section I discuss curiosity within the field of game design to articulate curiosity as manifesting in designed walker experiences.

### 3.3.3 Curiosity and Game Design

Curiosity is often acknowledged as an experiential factor in games but has lacked dedicated analysis within the field of game design. A comprehensive review and analysis of curiosity literature in relation to game design is outside my research scope. However, in this section I seek to highlight what curiosity means in terms of game design to articulate curiosity in the designed walker experience.

As early as 1980 Malone was already identifying curiosity as an intrinsic motivator for sensory and cognitive gameplay. Malone notes that curiosity can be designed for through surprising and constructive information feedback, and sensory audio and visual stimuli (Malone 1980, p.71). Within game studies, curiosity has been noted through game analysis models such as the *Four Keys of Fun* (Lazzaro 2004) and *Game Discourse Analysis* (Wouters et al. 2011). Both theoretical models partially encompass curiosity but treat it as a single unitary experience, suggesting an overlap
between curiosity and experiences of flow, enjoyment and other related player experiences during gameplay.

From a game design perspective, within the mechanics-dynamics-aesthetics (MDA) framework the game aesthetic “Discovery: game as uncharted territory” (Hunicke et al. 2004, p.2) can be identified as closely related to curiosity, in the player’s desire to explore to attain an understanding. Contrary to other theorists, Salen and Zimmerman (2004) draw upon Hallford and Hallford’s (2001) guide to computer role-playing game design, to note that an experience of curiosity when interacting with a system may be violated if the meaning of a player’s action is unclear and ambiguous (Salen & Zimmerman 2004, p.367), a distinction I do not agree with. This contrasts to interaction design theory previously discussed that argues curiosity may manifest by “maintain[ing] openness and ambiguity” to foster an experience of intrigue and curiosity (Gaver et al. 2004), perhaps indicating a separation between game design and ludic engagement expressed by (Gaver 2015).

These different descriptions of curiosity types reflect the contextual, disciplinary complexities in discussing such a broad experience. Such complexities are evident within the many definitions of curiosity identified by scholars across multiple fields of research, for example, as a lack of consistency (Malone 1980), a violation of expectations (Hunt 1963) and an experience in relation to uncertainty (Jirout & Klahr 1992).

For this research I adopt Loewenstein’s (1994) definition, utilised by design researchers Tieban et al. (2011) and game design researchers To et al. (2016). Curiosity is here defined as an information gap which arises when an individual becomes aware of a difference between “what one knows and what one wants to
know” and their perceived ability and desire to close that gap (Loewenstein 1994, p.87). Previously I had identified walker play as a desire to explore, discover and understand their environments, which resist being ‘gamed’ for the purposes of interpretation. We can draw similarities between walker design traits that suggest the trick of designing walkers is in making players to want to know, and Lowenstein’s definition of curiosity as a desire “to know” and “close” gaps.

To discuss curiosity in relation to game design, I primarily draw upon To et al.’s studies: Integrating Curiosity and Uncertainty in Game Design (To et al. 2016) and Modelling and Designing for Key Elements of Curiosity (To et al. 2017). To et al. present a useful taxonomical understanding of curiosity emerging through game design. We may use this theory as a resource to articulate and unpack experiences of curiosity that emerge during walker play experiences, within context of walker design.

It is important to note these types of formal design works do not present a formula for design, rather an understanding. These design models cannot not encapsulate numerous contextual complexities in a design that can affect how such an experience may be fostered. These can include factors as simple as a difference between “good” and “bad” implementation, or broader socio-cultural factors affecting the design and its reception.

To et al. (2016) discuss curiosity as manifested during gameplay as one of five types specifically related to game design elements. These are: 1) perceptual curiosity – how a person perceives normal stimuli and gives attention to novel stimuli, cued through gaps in perceptual information; 2) manipulatory curiosity – the curiosity people feel when encountering a novel object that can be explored manually; 3) curiosity about the complex or ambiguous – preference for observing or interacting with stimuli that are intricate, mysterious and contradictory; 4) conceptual curiosity – the desire to find
things out; and 5) adjustive-reactive curiosity – how people explore ordinary environments and connect expectations to the specifics of a given situation.

Although curiosity is noted within ludic design studies described by Gaver et al. (2004), Gaver (2006, 2015) and Deterding et al. (2011), To et al.’s discussion (2016, 2017) suggests that experiences of curiosity may manifest as different forms within different types and styles of game design. Although To et al.’s five categories do not directly speak to walker games but, rather, to many game types and design styles, we can identify a clear connection with type 3. To et al. (2016) identify ambiguity as categorically linked to curiosity; their description of stimuli that are intricate, mysterious and contradictory can be related to ambiguous elements within walker designs. Additional non-game design research of Tieban et al. (2011, p.362) also identifies a categorical relationship between ambiguity and curiosity.

Within walker play, one or multiple types of curiosity manifest. Slowing the pace of action, foregrounding the background and limiting the player’s awareness all create information gaps that emphasise what is unseen. These gaps provoke player curiosity to explore. Ambiguous environmental elements (e.g. utilising ambiguity of context and relationship) are discovered; the full extent of their significance is not known but implied. This information gap encourages speculative associations and connections to be drawn. Player exploration within walkers seeks to resolve information gaps, exposing further ambiguity and revealing the extent of the gap.

Furthermore, To et al. (2016) discuss a relationship between curiosity and uncertainty. Drawing upon Costikyan’s Uncertainty in Games (2013), 1) solver’s uncertainty; 2) hidden information; and 3) narrative anticipation (Costikyan 2013) are discussed as
useful for motivating, manipulating and accommodating players’ curiosity levels (To et al. 2016).

In 3.2.4 these types of uncertainty were identified within the theme of ambiguity in walker games: 1) information; 2) context; and 3) relationship. This included the suggestion of hidden information, solver’s uncertainty in resolving ambiguity and narrative anticipation in revealing ambiguity. This suggests an even stronger link in the relationship between ambiguity and curiosity within walker games, specifically in revealing the unknown and negotiating information gaps through exploration and observation.

In Chapter 6 I will draw upon the five categories identified by To et al. (2016) to articulate how manifestations of curiosity emerge through walker design characteristics, and upon Costikyan (2013) to articulate elements of uncertainty.

It is evident from the literature cited that curiosity exists across many types of games and emerges through varying design approaches, techniques and models. The types of curiosity that emerge through walker play may be present in other exploratory game types or genres, such as FPSs. Although this is not a comprehensive overview of curiosity, within this group of high-visibility walkers I have isolated, we can understand that curiosity is a major experimental trait.

We can identify that, through these walker design characteristics – 1) Player Interaction, 2) Temporal Space, 3) Player Focus and 4) Ambiguity – curiosity manifests and emerges. Exploration in walkers is a negotiation of designed ambiguity, and ambiguity is a resource for curious information gaps, things we do not understand but wish to. Unlike other types of games, walkers stubbornly refuse to answer our curiosity; ambiguity is exposed and interpreted, but cannot be clearly resolved,
understood or ‘mastered’. As such, information gaps remain. Design ambiguity is sustained, used to stretch out this experience of curiosity within walkers and keeping us from ever fully understanding, even if the explorable game space has been fully discovered.

3.4 Conclusion

In conclusion, this chapter investigated the following questions: What gameplay experiences do walkers elicit, and how might designers understand these experiences? What are the game design attributes that engage players to explore 3D walker environments?

I have investigated four key walker titles within a key moment of the genre: Dear Esther (2012), Proteus (2013), The Stanley Parable (2013) and Gone Home (2013). Utilising two alternative qualitative frameworks I analysed my player experience of each walker game, and in doing so identified four shared walker design themes: 1) Player Interaction; 2) Temporal Space; 3) Player Focus; and 4) Ambiguity. Themes highlight insights contained within walker games as game design knowledge.

Findings based on the resulting themes, conclude that the walker lies partly outside of conventional game design by re-contextualising game design conventions to reframe the game experience as something not to be overcome. The walker experience is one of keen perception and close enquiry around ambiguous elements that resist being ‘solved’ or clearly understood. In doing so subjective, interpretive readings of such elements are encouraged. These results suggest that walkers contain shared formalistic design traits but are alternative to common forms of digital games, as information feedback and clarity in disseminating environmental information is often seen as desirable for navigation purposes. It has been argued that game design is not
conducive towards this trait, and walkers may share more in common with ludic design approaches that are less systematically focused.

The open-ended, interpretive and ambiguous traits of walker games reveal an experience of curiosity manifested through their design; an information gap which arises in our awareness of what we know and what we want to know. Walkers cannot be mastered or ‘gamed’ like a challenge-focused or goal-directed digital game, or clearly understood as narratives imbued in their explorable levels, and yet we still wish to understand them. Although information gaps may be revealed and exposed through spatial exploration, they often remain unresolved and inconclusive. The experience of curiosity in walkers is extended and drawn out through sustained ambiguity throughout the explorable game space.

In light of these findings, how can these lessons be applied through design? More specifically, the following question is raised:

How can these design attributes be used to design first-person walker games and 3D games more broadly?

As a result of this study and in response to these remaining questions, I constructed a provisional list of recommendations for designing walker experiences. These are not formal conclusions, but an attempt to further unpack my four themes as more actionable and applicable design knowledge, and as a starting point for my design project discussed in Chapter 4. It is important to note my recommendations are general considerations that do not factor many of the particulars and details involved in design. These include “good” and “bad” implementation or socio-cultural context e.g. the timing of creation or release.

• Direct player focus towards the audio-visual
• Allow players to slow down and set their own pace
• Allow players to indulge in background elements
• Fragmentation of information can provoke navigation
• Player exploration is an ongoing process of interpretation and understanding
• Allow for moments of thinking and consideration of the world
• Aim for curiosity and provoking imagination

In Chapter 4, analysis insights form the basis of further investigation. I will adopt a practice-based method to action these walker design characteristics, informing my own investigative walker design. Through this I seek to develop design knowledge that considers walker insights for broader design application, and to understand how these attributes may engage players in game exploration experiences.

3.5 Epilogue: Findings in Contemporary Context

In light of my conclusions, I seek to review findings based on the 2012-2013 historical specificity of the four walker games (Dear Esther, Gone Home, The Stanley Parable, Proteus) and the time when the study was conducted, 2015. Street’s 2016 critique of walker game studies noted in 2.3 and 3.1 makes a strong case in significant and artistic evolutions outside of studio or ‘Triple I’ walker games are often overlooked within scholarly fields. I agree with this criticism. Within the year time-period between my study and Street’s (2016) critique there were divergences and noteworthy evolutions and in genre, more significantly now in 2018 as I note in 2.3.3.

Such frequency in evolutions, developments, and changes (even within a year-long period) highlights a strength in my adoption of a historical focus; it is ultimately impossible for a researcher to predict or retroactively adapt to such changes when conducting a thorough analysis. However, I acknowledge the limitations in the contextual-specificity of my analysis and findings.
Therefore, in this section I seek to better contextualise my findings in hindsight. This decision is not part of the analysis process, nor to retroactively legitimise my 2015 study and findings. Instead, through additional discussion I will better articulate these different periods of walker games through comparison, drawing upon more recent walker and walker-like games drawn from a 2014 to 2018 period following my 2012–2013 focus, and my four walker design themes. Discussion will make clear the aesthetic and historical specificity of the ground I am working from in my research, and better specify my chosen set of references for future investigation.

Below I will introduce and briefly describe seven DIY and studio walker titles noted in 2.3 and selected in response to Street’s (2016) critique and discuss all in relation to my four walker design theme findings: 1) Player Interaction; 2) Temporal Space; 3) Player Focus; and 4) Ambiguity.

Recent DIY walkers

Recent trends in walker games highlighted in 2.3.3 include an emergence of smaller scale DIY walkers often created by single-person teams; creators include Moshe Linke, Kitty Horrorshow, and Strangethink. As discussed by Street these DIY walkers are part of a “larger movement in game design towards quiet, contemplative, unsettling experiences made by individuals or very small groups”, counter-cultural in development practice and focus to larger ‘studio walkers’ including Gone Home, The Stanley Parable, and Dear Esther (Street 2016). Street argues DIY walkers share more in common with Proteus, a smaller-scale and less outwardly narratively focused title created by two developers (Ed Key and David Kanaga). However, I note these emerging DIY walkers do share general formal walker qualities previously outlined in
Chapter 2: 1) minimal mechanics; 2) spatial exploration; and 3) environmental narrative, revealing broad similarities despite differences.

Below I will describe four DIY walkers: These Monsters (2016), Fugue in Void (2018), Bernband (2014), and CHYRZA (2014), and compare these titles to my four walker design themes.

![Figure 41: Screenshot, These Monsters (2016) (Strangethink 2016).](image)

The interior of a gallery building lined with ink-blot styled portraits of creatures and scattered televisions which rapidly blink text, alluding to a sinister purpose.

These Monsters is described by creators Strangethink as:

“You are trapped in an infinite series of island museums, you can try and escape through the black doors but you are just getting yourself deeper into trouble. All you can do is look at the faces of the monsters and learn about them through the evil television sets.” (Strangethink 2018).

In These Monsters players explore a series of brightly coloured, randomly generated, interconnected, and endlessly looping art galleries. Each gallery is filled with alien
artworks and sinister television screens placed within black puddles, which loop vague scrolling text. There is no end to exploration, which the creator states up-front in the game description; each gallery connects to another. As players gradually explore from gallery to gallery, moving through interconnected portals, both architecture and artworks subtly warp and shift over time, a change felt but difficult to discern during the exploratory experience.

Figure 42: Screenshot, Fugue in Void (2018) (Bell 2018).

A cathedral-like interior characterised by its angular architecture, flat, exposed concrete, and soft, dimly diffused lighting, giving the location a familiar but unusual atmosphere.

Fugue in Void (2018) is described by creator Moshe Linke as:

"An artistic audio visual experience. Explore all kind of mysterious places and dive into a world full of atmosphere. Let this experience unfold in your head. Let it inspire you" and is characterized as "The perfect break from all those action packed games out there" (Linke 2018).

In Fugue in Void players gradually explore a series of surreal and alien science fiction environments, each characterised through a use of monotone colours and angular 3D
geometry. Explorable environments are introduced through an extended, meditative sequence of slowly unfolding visual animations, lights, and patterns. These sequences recur throughout the game as moments without of spatial exploration. Each location that players may explore features a colossal and often claustrophobic designs, inspired by real-world Brutalist and monolithic science fiction architecture.

A small speakeasy bar hidden along a quiet corridor. This is one of the many unique locations discoverable in the densely-packed explorable alien city, characterised by its low fidelity visuals and ambient sound effects.

*Bernband* (2014) is described by creator Tom as:

“explore the city of the pff, 23 or something unique locations to discover, it's family-friendly.” (Tom 2018).

In *Bernband* players explore a claustrophobic network of looping rooms, corridors, streets, and balconies nestled throughout a densely populated alien city, populated by pixelated alien inhabitants. The player's view of the world is characterised by two cartoonish alien hands pointing outwards in front of the unnamed player-character,
like a child awkwardly taking their first steps. Despite the presence of many non-playable characters throughout the city, all are non-interactable and function more as decorative objects. These pixelated characters give liveliness to the world in contrast to its often monotone and dark urban atmosphere.

Figure 44: Screenshot, CHYRZA (2014). (Horrorshow 2014)

One of multiple large, monolithic, and starkly coloured structures populating the desert landscape, alluding to an ancient and mysteriously unexplained civilisation.

CHYRZA (2014) is described by creator Kitty Horrorshow as:

“a first-person flash-fiction horror story. explore a surreal desert while collecting fragments of a memoir” (Horrorshow 2018).

In CHYRZA players explore a large empty desert landscape characterized by a dull-brown fog and populated by dark, colossal, unnatural geometric monuments. These structures vary from obelisks, pyramids, arches, and towers, to animated, moving floating platforms. While exploring these monuments players collect floating objects, each contains a piece of character’s memoir describing their time in the desert. These are activated as audio monologues that provide historical insight, contextualising the
setting and horror atmosphere and divulging the fate of its unseen inhabitants. This use of voice-over audio with environment exploration is similar *Dear Esther*, most notably in its ambiguity of the space and poetic narration.

As argued by Street (2016) these DIY walkers in ways do share more in common with *Proteus* (2013): in reduced scale, scope, and focus towards their explorable environments as atmospherically rich and less outwardly narratively driven. In particular, all place specific emphasis on audio-visual qualities and movement through space, like historic walker titles, although without 3D environmental detail or written text to discover. In addition, these four DIY walkers share much in common with the four walker design themes:

1) Player Interactivity: All four DIY walkers feature limited movement controls primarily for purposes of navigation and observation of the 3D environment. All feature a slow movement pace, although this is influenced by their different level layout designs. None feature a contextual ‘touch’ interaction mechanic like *Gone Home* or *The Stanley Parable*, but do make use of algorithmic components and activation triggers e.g. audio monologues in *CHYRZA*, gradual animations in *Fugue in Void*, location-specific sound transitions in *Bernband*, and shifting television screens and randomization in *These Monsters*.

2) Temporal Space: Each DIY walker discussed contains a reduction of conflict or obstructions that may impede navigation and emphasise ongoing exploratory navigation; players finding their way through game spaces, be it orientation in a vast landscape, or direct movement through networked corridors. Despite differences in level layouts and game structures that effect the temporal navigation flow, all use their 3D architecture to occluded surroundings, and to
draw out and reduce navigation pacing. For example, long corridors and right-angled corners in *Fugue in Void* and *Bernband*, the vast foggy desert in *CHYRZA*, and the endlessly generated buildings in *These Monsters*.

3) Player Focus: Each DIY walker does not feature any onscreen information, the player’s in-game perspective is directed entirely towards the visual and audio elements, specifically those within 3D environment. The player-characters in each are not physically represented in game, aside from *Bernband*’s humorous alien hands. Emphasis, like historical walkers, is placed on the explorable environment as the principle game character.

4) Ambiguity: A less narratively prominent factor when compared to historic walkers studied, however, designed ambiguity is visible in the spatial-exploratory traits of all four DIY walkers. Ambiguity of information is present in each: All are ambiguous in premise and their environments mysterious focal points; discoverable worlds to be uncovered and understood through exploration. All feature an ambiguity of context: Each uses points of interest that gesture towards meaning, and recurring locations that are contextually reframed with further insight e.g. *CHYRZA*’s monoliths, or *Bernband*’s hidden speakeasies. All make significant use of ambiguity of relationship: Each environment is non-explicit in presentation and features interpretive qualities in its overall audio-visual and level composition, for example, *These Monsters*’ abstract portraits, *Fugue in Void*’s evocative visuals and architecture, *CHYRZA*’s suggestive monoliths and monologues.

It can be argued that ambiguity plays an even more prominent role within their level designs, due to their heightened spatial-focus. Each uses specific artistic traits to more heavily stylize their environments to foster an atmosphere. Through fewer elements
these DIY walkers generate a sense of place and imply narrative through exploration gameplay, without the support of additional, combined elements. For example, higher visual fidelity in polygon count and textures to telegraph specific information (e.g. detailed points of interest, photographs), discoverable written text (notes, diaries, textured graffiti), and frequently activated played narration (e.g. prominent and responsive narrators).

**Recent studio walkers**

We may extend this comparison to more recent ‘Triple I’ studio walkers *Everybody’s Gone to the Rapture* (2015) and *Tacoma* (2017), created by the same developers as the landmark titles studied. In addition, I would like to further extend comparison to horror game *SOMA* (2015) whose exploration-focused ‘safe mode’ reframes the existing game experience into one we may consider walker-like.

Unlike DIY walkers discussed, each of these titles significantly expands in scope upon the traits and characteristics present in historic walkers, namely *Dear Esther* and *Gone Home*. Noteworthy changes include a significant increase in visual fidelity (more specifically in rich environmental detail) and an increase in voice acting use and actor cast. Both further emphasise narrative within their game experiences, and discovery during game world exploration as an act specifically conducive to revealing narrative information to contextualise the setting. Although audio takes further precedence there remains a focus on environmental insights within detailed points of interest and written text, only discoverable through careful observation.
The historic period-appropriate British setting is picturesque like *Dear Esther*’s Hebridean island, but far more welcoming and grounded in its outwards presentation and humanising details.

*Everybody’s Gone to the Rapture* (2015) is described by developers The Chinese Room as:

“Immerse yourself in a rich, deep adventure from award-winning developer The Chinese Room and investigate the last days of Yaughton Valley. Uncover the traces of the vanished community; discover fragments of events and memories to piece together the mystery of the apocalypse.” (The Chinese Room 2015).

In *Everybody’s Gone to the Rapture* players explore a mysteriously abandoned British village within a 1980s period setting, which includes period appropriate homes and locations including a pub, each rich in decoration and detail despite the expansive scope of the environment. Like *Dear Esther*, *Rapture* features an orchestral score that punctuates moments of exploration, and voice-over work has been expanded from a single narrator. As players explore the town they may listen in to voices on radios within environmental clutter, and in addition, interact with animated, otherworldly
floating lights that trail about the game world often near points of interest. Upon following and approaching these lights players may ‘tune in’, resulting in cloudy character silhouettes to appear and engage in dialogue. Through exploring the town, listening in and observing character dialogue, players construct an understanding of the town and its inhabitants through different fragments scattered throughout.

![Figure 46: Screenshot, Tacoma (2017) (Fullbright 2017).](image)

*Tacoma*’s space station features multiple detailed habitats, each stylised to reflect the personalities of individual crewmembers. Holographic recordings of crew members can be activated and manipulated; played back, rewound, fast forward, or paused, allowing players to easily draw connections between moments in dialogue exchanges and environmental features such as computers, handwritten notes, or object details.

*Tacoma* (2017) is described by developers Fullbright as:

“Tacoma is a narrative adventure set aboard a high-tech space station in the year 2088. As you go about your mission, you’ll explore every detail of how the station’s crew lived and worked, finding the clues that add up to a gripping story of trust, fear, and resolve in the face of disaster.” (Fullbright 2017).
In *Tacoma* players explore a richly detailed and unoccupied space-station in a future sci-fi setting. Like *Gone Home*, the premise centres on the mysterious absence and history of its former inhabitants, discovered through observing material objects and written notes within interconnected rooms. Unlike *Gone Home* as players explore they may interact with the station’s surveillance system, allowing the playback of fully-animated and voiced character silhouettes (there are six characters in total on the station). These characters feature motion captured animations, allowing players to observe body language in addition to voice acting, for further insight in drawing connections between these and environmental details like interactable computers, pick-up-able objects, or readable notes.

Both *Everybody’s Gone to the Rapture* and *Tacoma* adopt a more opened-ended level exploration more akin to *Proteus* and *Gone Home*, allowing for wandering navigation movements. Although both games are a solitary exploration experiences, each walker places specific emphasis towards their ghostly animated and voiced characters; projections players can activate once discovered. Emphasis towards this element pushes walker-gameplay further towards that of an exploratory radio-drama or stage-play.

Developer and artist Robert Yang draws comparison between *Tacoma*’s design progression from “audio diary design and walking mechanics” to the “immersive theatre installation” *Sleep No More*, which involves the audience “wandering around a large dense environment and encountering short dramatic scenes of characters performing with each other [although with little dialogue] … and then the characters split-off and you have to choose who to follow and listen to” (Yang 2017). Yang describes *Sleep No More* as an experience that does not up to withstanding detective-like scrutiny but is instead highly ambiguous in its “gestural storytelling”. Yang criticises
*Tacoma* for lacking ambiguity in this regard, most notably in the use of character holograms, arguing their features are paradoxically explicit yet abstract, revealing a lack of interpretive possibilities to create emotional connections; notably when compared to *Gone Home*’s use of setting: “People can relate to Gone Home’s spooky mansion or Americana furniture as iconic culturally-grounded objects” (Yang 2017). Coincidently, Bozdog and Galloway (2016) draw similar parallels between *Sleep No More* and *Dear Esther* in its approach to ambiguous presentation and narrative affordance through an exploratory audio-visual environment.

The four walker themes found in historical walkers are present in both *Everybody’s Gone to the Rapture* and *Tacoma*, although with differences:

1) Player interactivity: Both walkers utilise minimal mechanics and slow movement pacing. However, players are afforded more control in the activation and playing out of triggers, visualised through the character silhouettes. Furthermore, *Tacoma* adds additional complexity in the manipulation of these; options to rewind, pause, and fast-forward.

2) Temporal Space: Both walkers reduce conflicts and obstructions, and reduce navigation pace, placing emphasis on the observation of audio-visual elements. Like their predecessors much focus is placed on the 3D game space as an explorable and observable environment, and not one to be overcome. However, audio plays an even larger role within these two titles.

3) Player Focus: *Rapture* features a sparse and minimal user interface; *Tacoma* features few additional UI details including a character portrait and name displayed onscreen when a silhouette is looked at, and onscreen playback control feedback. In both the player-character is deemphasised and focus is directed towards environmental surroundings.
4) Ambiguity: Both feature multiple types of ambiguity in presenting ambiguous information, contextual ambiguity, and an ambiguity of relationship. However, we may make a distinction in this trait of ambiguity between these recent walkers, most notably *Tacoma*, and historic walkers studied. As noted by Yang (2017) *Tacoma's* design emphasises observation of 'virtual actors', which much more strongly define the setting and its contents in such a way that reduces interpretive ambiguity. Yang's argument suggests a reduction in ambiguity of context and relationship qualities that negatively influences the experience. Comparatively, although *Rapture* features voiced ghostly figures, and is less narratively ambiguous than *Dear Esther's* discoverable and often contradictory information sources, their fragmentation and discovery through the explorable game world results in an ambiguous effect closer to *Gone Home’s* multiple fragmented information strands.

![Figure 47: Screenshot, SOMA (2015) (Frictional Games 2015).](image)

The underwater research station PATHOS-II is a science fiction world comprised of multiple habitats and exterior underwater sections, filled with richly detailed objects, non-playable characters to interact with, and different items to carry and use.
SOMA (2015) is described by developers Frictional Games as:

“Enter the world of SOMA and face horrors buried deep beneath the ocean waves. Delve through locked terminals and secret documents to uncover the truth behind the chaos. Seek out the last remaining inhabitants and take part in the events that will ultimately shape the fate of the station”. (Frictional Games 2015).

Horror game SOMA allows players to enable a ‘safe mode’, disabling the threat of hostile monsters that must normally be sneaked past and avoided. Although these monsters are still present they take on a non-hostile form wandering the game environment. This transforms the game experience into one we may consider walker-like. It is, in some ways, similar to Everybody’s Gone to the Rapture, Gone Home, The Stanley Parable, and Tacoma.

In SOMA players explore a series of undersea habitats containing various rooms, corridors, and environmental details to investigate. Within the safe mode context SOMA places emphasis on spatial exploration and a discoverable environmental narrative. Much like Rapture and Tacoma it is rich in details both in the 3D game world, and in the use of written text and voice acting. SOMA makes heavy use of multiple fully-voiced characters, including the player-character themselves who is visually fully-portrayed in game. The player is rarely alone, and many sequences contain fully animated and acted events with drama, tension, and stakes.

Furthermore, unlike walker titles discussed, SOMA makes heavy use of puzzles, specific interactions, and a tool inventory throughout its game experience. Puzzles are often mandatory and must be resolved to progress through the undersea complex. Each varies in complexity and those more advanced include drawn out sequences
where players must perform multiple steps, sometimes in different locations e.g. in one room interacting with functions on a computer terminal, which relates to actions performed on an electronic panel in another.

Although walkers such as Gone Home, The Stanley Parable, and Tacoma do gate exploratory navigation like SOMA by having players meet certain conditions (e.g. finding a key), these conditions do not involve explicit puzzle solving, logic puzzles, or step-by-step activities. As discussed in 3.2.2, Theme 2: Temporal Space, this form of environmental gating instead serves more of a purpose in pacing navigation, to draw player attention to environmental details that would otherwise be considered decorative. For these reasons although SOMA with safe mode enabled contains walker-like traits, it shares fundamental differences to those broadly identified within the walker genre (see 2.3) and the historic walker design themes (see 3.2). Furthermore, the trait of ambiguity is present within SOMA, however the exploratory game world and its contents are heavily influenced by narrative exposition, including a plot that centres on character drama. Much ambiguity within the designed game experience is relegated to the background in visual environmental details, most notably the discoverable and unexplained point of interests.

**Conclusion**

In conclusion, discussion highlights both similarities and differences between historical walkers and those more recent. Evidently, the four walker design themes reveal a divergence in the genre over the 2014 to 2018 period, as argued by Street (2016). This is most notable in studio walkers, which reveal a movement away from a spatial audio-visual focus towards audio storytelling as locus in the designed game experience. Although walker design traits are indeed present in both studio and DIY
walker titles, the trait of designed ambiguity takes on a less prominent role in the studio walkers discussed; both suggest a shift towards more character-focused interactive-storytelling forms.

Differences in the trait of designed ambiguity are most notable in their experiential qualities. The mental process of “meaning making” in walker-play (discussed in 3.3), arises as players derive a collective interpretation of discovered ambiguous game elements. Although present, an emphasis placed on moments of character dialogue reduce possibilities for such an experience to emerge during exploration. As noted by Yang (2017), clearer definition of the game world through more explicit information conveyed reveals a move away from gestural ambiguity, consequentially influencing how players may derive possible interpretations and meanings. These traits are present in historic walkers studied e.g. Gone Home and The Stanley Parable, but not heightened. These differences are distinct when compared to DIY walkers discussed.

In closing, discussion reveals the walker genre is an ongoing aesthetic movement, which continues to evolve and develop as a genre since its landmark years of 2012 to 2013. Although divergences in walker types indicates limitations in broad genre classification and formalised knowledge, findings highlight the importance in specific identification and analysis of characteristics, when discussing game experiences within a design context. Furthermore, the divergence in walker approaches reveals significant interest in ambiguity as its own experiential focus and outcome.

We may understand my four walker design themes as not fully encompassing the contemporary walker genre, but as a specific focal lens towards spatial-exploratory walker design, in which ambiguity and experiences of curiosity are an experiential outcome.
In the following chapter I will further advance my analysis findings through a design investigation to address the question:

How can these design attributes be used to design first-person walker games and 3D games more broadly?
Chapter 4: Design Project, WORLD4

4.0 Overview

In Chapter 2, I identified limitations in popular, foundational game design literature in discussing the walker within a game design context, and potential insights the genre may yield for the field. In Chapter 3, I conducted an analysis of four key walker games from 2012 - 2013 and identified four common walker design themes: 1) Player Interaction; 2) Temporal Space; 3) Player Focus; and 4) Ambiguity. I identified the walker experience as a curious one, drawn out and fostered through ambiguity, a pertinent characteristic in their design.

In this chapter I build upon walker design lessons from Chapter 2 and 3, to address the following question:

How can these design attributes be used to design first-person walker games and 3D games more broadly?

As a starting point for my design project I utilised the four walker design themes and provisional recommendations for designing walker experiences, outlined in Chapter 3. These informed my design of WORLD4, a first-person exploration walker game created iteratively over a 11-week period within 3D game engine Unity. In WORLD4 I seek to heighten ambiguity as an experiential outcome by presenting a multi-view exploration experience where players explore a 3D, layered, visually abstract world. Through this chapter I discuss my rationale and decisions made during the design process.

Readers who wish to play WORLD4 can find download links and instructions in Appendix D.
In 4.1, I discuss my transition to practice-based research in light of Chapter 3 results, drawing upon Pinchbeck’s manifesto for development-led research (2010), Candy’s practice-based research model (2006), and Zimmerman et al.’s research-through-design framework (2007).

In 4.2 I introduce WORLD4 and discuss the underlying rationale and motivations behind its design. These include my use of walker design themes, recommendations, and design inspirations. I highlight five major design features of WORLD4 during its design and development: views; hidden objects; exploratory layout; distinct moments of discovery; memorable iconography.

In 4.3 I discuss the design and development of WORLD4 through each of the five major design features. I discuss how each feature was created iteratively, through thoughts, decisions, and experimentations during a ‘bottom-up’ design process. Through specific examples I highlight a collision between theoretical ideas and technical constraints that informed how WORLD4 was designed.

4.1 Approach

As a practising game designer and developer, I can take advantage of my existing practical design knowledge as a methodological approach. I adopt a DIY developmental position as an opportunity to utilise and action theoretical lessons from Chapter 3, in the pursuit of deeper design knowledge and meaningful practical application. In doing so my research shall undergo a methodological turn towards practice-based research, an approach not uncommon within broader design research fields.

Practice-based research is defined by Candy (2006) as a contribution to knowledge demonstrated through creative outcomes, which may include a design artefact. Unlike
pure practice, a practice-based research artefact arises through a structured and documented process as a basis of the contribution to knowledge. In defining practice-based research, Candy refers to the UK Arts & Humanities Research Council’s definition of research process (Candy 2006, p.2) the model under which Dear Esther (2008) was created.

My decision to adopt a DIY, practice-based methodology was largely influenced and motivated by Pinchbeck’s research work, notably his essay I Build to Study: A Manifesto for Development Led Research in Games (2010) noted in 2.1. In addition, to structure and support my practice-based method I have drawn upon Zimmerman et al.’s research-through-design framework (2007).

In Pinchbeck’s I Build to Study: A Manifesto for Development Led Research in Games (2010) the creation of Half-Life 2 horror modification Korsakivia (2009) is described. Like Dear Esther (2008), Korsakivia was created in response to theoretical questions raised in a structural analysis of FPS games, and in response to methodological limitations in theoretical research. Through a practice-based methodology, Pinchbeck describes providing game design insights that “fall outside the body of work we draw upon for analysis and study”, revealing the limitations of traditional design wisdom (Pinchbeck 2010). Although Pinchbeck’s motivations speak more to games studies researchers adopting design practice, I was surprised and inspired by his approach because his motivations relate to my own.

These include addressing limitations in theoretical approaches, specifically my reliance on traditional game design wisdom, often at odds with walker traits (as noted in 2.3 and 3.3), and to contribute original and relevant, applied design knowledge. Pinchbeck argues this development-led approach forces games researchers to
confront the “harsh realities” of design and development and take a proactive role in exploring “new game forms, or new understandings of existing game forms located within them”, testing areas of untapped potential through design innovation (2010). Through my change in research approach I seek to integrate material and process insights as worthwhile knowledge, in constructing new design theory.

To support my methodological change, I have drawn upon Zimmerman et al.’s (2007) research-through-design framework, which presents a more formalised approach to conducting practice-based research. Zimmerman et al.’s method is however not games focused. It is placed within the field of human–computer interaction design, with the motivation to enable researchers to engage with problems that cannot be easily addressed through “science and engineering methods” (2007 p.9). In the research-through-design approach thinking occurs through a prototyping cycle.

Zimmerman et al. present a set of four lenses as criteria for evaluating this cycle within interaction design research: 1) process – documentation of process; 2) invention – a novel integration of subject matters; 3) relevance – contribution to the relevant community; and 4) extensibility – the ability to build on resulting outcomes to contribute/ taking future growth of the design into consideration (2007, p.7). By meeting these criteria, Zimmerman et al. argue that knowledge may be transferred to the practising community and allow designers to make research contributions “that take advantage of the real skill designers possess” (2007, p.9).

Despite an interaction-design focus, Zimmerman et al.’s framework provides general guidelines for conducting scholarly practice-based research, which I have adapted for my own. This includes the following: invention and relevance of the underlying project rationale, which I base on prior theoretical findings (discussed in 4.2); documentation
of design process through iterations in key features (discussed in 4.3); building on project outcomes, which I engage in through a two-stage player study (discussed in Chapter 5); extending insights, which I synthesise as findings discussed in Chapter 6.

Through this approach I seek to fulfil underlying motivation of mine, to advance theoretical knowledge into the broader community of practice within game design through first-hand engagement.

4.2 Introducing WORLD4

In my design project WORLD4 players explore a mysterious and interconnected game world fragmented across four simultaneous first-person perspectives. Each perspective is comprised of four viewports on a single screen and provides a partial view of the 3D world. Players navigate through a series of visually obscure, abstract corridors and chambers, negotiating visual and spatial differences between the four viewports to reveal discoverable, hidden geometric sights.

![Figure 4.2: Screenshot, WORLD4.](image)
The design of *WORLD4* prioritizes first-person spatial navigation and an exaggeration of the ‘looking’ mechanic, a key difference to existing walkers. My decision to choose this feature was motivated as an exploration of the walker design themes identified in 3.1, most notably the trait of ambiguity, which I discuss further in 4.3.

As a conceptual basis and inspiration for *WORLD4*’s design my four walker design themes were used: 1) Player Interaction – reduced interactions, in-game pressures and explicit challenges; 2) Temporal Space – reduced in-game temporality with slower navigation speeds and emphasis on environmental details; 3) Player Focus – removal of onscreen UI information and in-game visual occlusion to heighten the audio-visual as a point of enquiry; and 4) Ambiguity – obfuscation of the game space and environmental elements that cannot be clearly solved or understood.

In addition, the seven provisional walker design recommendations constructed in the Chapter 3 conclusion were used to guide my design choices:

- Direct player focus towards the audio-visual
- Allow players to slow down and set their own pace
- Allow players to indulge in background elements
- Fragmentation of information can provoke navigation
- Player exploration is an ongoing process of interpretation and understanding
- Allow for moments of thinking and consideration of the world
- Aim for curiosity and provoking imagination

*WORLD4*’s underlying design rationale and premise concerns constraints. These account for design scope, research focus, and DIY resource realities. In light of my design research focus I decided the project would concentrate primarily on the trait of spatial-exploratory ambiguity, prioritising player navigation mechanics and spatial
level design factors. In doing so I decided to exclude prominent walker characteristics previously identified, most notably a storytelling focus that includes factors such as a written narrative and voiceover acting (e.g. *Gone Home*, *The Stanley Parable*) and complex, rich audio soundscapes (e.g. *Dear Esther*, *Proteus*).

My project focus significantly diverges from historic landmark walker games studied in Chapter 3, towards more recent spatially-focused DIY walker titles, including *These Monsters* (2016), *Fugue in Void* (2018), *Bernband* (2014), and *CHYRZA* (2014) discussed in 3.5. As highlighted by Street these walkers unlike their higher-fidelity counterparts share a focus towards spatial concepts, defined by limitations in production resources and scale as part of a “larger movement in game design towards quiet, contemplative, unsettling experiences made by individuals or very small groups” (Street 2016).

I too would be acting as both the principle developer and solo researcher without much external help and production budget. Both reflect overall similarities in my own DIY design approach. However, despite similarities, as I am inheriting theoretical design lessons highlighted from key historic walkers. I acknowledge that because of this hybrid lineage, unlike other walkers discussed *WORLD4* may not strictly classify as a DIY walker.

In Chapter 3 discussion my focus shifted towards the finding of designed ambiguity as a noteworthy walker trait, largely unexplored within game design theory and academic literature. When conceptualising and developing the design project, *WORLD4*, I intended for the aspect of ambiguity to permeate through the overall design, enhanced by reducing explicit guidance, concealing and withholding the explorable parts of the environment.
When considering ambiguity as a core design aspect of WORLD4, I returned to Gaver et al.’s statement of ambiguity as a resource, which allows designers “to engage users with issues without constraining how they respond”, “allows the designer’s point of view to be expressed while enabling users of different sociocultural backgrounds to find their own interpretations”, and “can make a virtue out of technical limitations by providing the grounds for people’s interpretations to supplement them” (Gaver et al. p.233). As I acknowledge in 3.3 ambiguity is in itself a complex topic of discussion beyond, for example, in The Ambiguity of Play Sutton-Smith (2001) notes play is in itself ambiguous, and sources of ambiguity in play are manifold.

In 3.3, curiosity was noted as a noteworthy experiential trait in walker games, closely linked to designed ambiguity and the creation and sustaining of information gaps. As part of my intended designed ambiguity, I considered the emotions of curiosity noted in Chapter 3, returning to Loewenstein’s definition of an information gap that arises when an individual becomes aware of a difference between “what one knows and what one wants to know” and their perceived ability and desire to close that gap (1994, p.87). To support this, I drew upon To et al. (2016), and uncertainty, discussed at length by Costikyan (2013) as another possible experiential outcome.

4.3 Designing WORLD4

In this section I discuss the process of designing WORLD4 through five major design features: views; hidden objects; exploratory layouts; distinct moments of discovery; memorable iconography. WORLD4 was developed over a 11-week period, primarily created by me with contributions from fellow PhD student and friend, William Goddard, including programming assistance and on-the-spot feedback. Software used was free,
including the *Unity* game engine, *Blender* 3D modelling software, and *BFXR* and *Audacity* audio software.

The design process of *WORLD4* can be described as a collision between theoretical ideas from Chapter 3 and technical experiments. As will be seen in the sections below design decisions surfaced organically through a series of iterations in response to walker themes and guidelines, conversations with colleagues and reflection, technical experiments, and observations during informal playtest sessions.

My design process was not an iterative one created through multiple, formal evaluations i.e. testing a design using user feedback and incorporating data into subsequent iterations. Instead, my iterative process was a series of small iterations not driven by data, but based on previous game projects, my own thoughts, feedback from peers and observed impressions from players during development.

My process is not concerned with iterating upon design theories put into practice, but in developing a deeper, close understanding of the design through reflection and further in-depth analysis, which extends into player studies and data analysis in Chapter 5. Further research work could include additional design projects to sharpen knowledge produced (see Chapter 6), however this is beyond the scope of my research.

I will discuss each major design feature, and chronologically step through decisions, choices, and considerations made at stages different of its design. I will highlight how various elemental components were informed by theoretical knowledge, external influences, and developmental insights, and were iterated on. Through this I shall discuss challenges encountered and decisions made to resolve these. Discussion
draws upon theories and methods from the field of game design and broader design research to inform design choices.

Features discussed include experiments and challenges in onscreen views, creating an environment both suited to the four-viewports and interesting to navigate, and integrating an amalgamation of appropriate game level techniques.

4.3.1 Views

Like walkers previously discussed, WORLD4 utilizes a first-person perspective and navigational movements controlled using a keyboard and mouse. These are fundamental core mechanics in walker games for observation and navigation. WORLD4 differs however; the player’s first-person view is made up of four simultaneously rendered camera outputs to four separate onscreen viewports, divided across the monitor’s display. The effect is four multiple first-perspectives on screen; what can be seen in one viewport may not be visible or may appear different in another.

Figure 49: Screenshot, WORLD4.
An example of the four views used $WORLD4$. Image Key – 1) The cube in the bottom right is a different colour in each viewport; 2) A white silhouette of an opening viewable in viewports 1, 2, 4; 3) The pink opening doorway visible in viewport 3. This example illustrates how in-world elements are variable as to what viewports they may appear in.

The ‘quad-view’ design in $WORLD4$ came about through a messy iterative design approach, consisting of reflection upon Chapter 3 results and prior game projects, discussions with friends and colleagues, multiple prototypes within Unity, and quick, informal playtest sessions to gauge interest and gain observational feedback. Following a period of conceptualisation, the final multiple-view design choice was a result of a series of small iterations.

**Conceptualisation**

Conceptual inspiration for the four-viewport design had no single clear point of genesis but was a result of simultaneous reflection upon the four walker themes, prior game projects and research work, and multiple discussions with friends and colleagues.

While summarising Chapter 3 results for publication (see Muscat et al. 2015) I reflected on each walker design theme. My thoughts were primarily occupied with Theme 1, *Player Interactivity* and Theme 3, *Player Focus*, and the design consideration “direct player focus towards the audio-visual”. These suggested the interaction of ‘looking’ as a rich and quintessential to walkers, universal across all walker types but distinct to other genres (e.g. the FPS) in its contextual framing.

With these thoughts in mind I considered how the walker interaction of looking could be further enhanced, for the purpose of heightening player focus towards the audio-visual. Experimentation with looking mechanics had been relatively unexplored within the genre. By altering or modifying the mechanic of looking I believed I could adopt a novel experimental approach to enhance these walker themes.
While thinking through these ideas, I derived inspiration from two prior projects. A previous game project of mine, *Deep Rift* (2014), had experimented with a ‘looking’ mechanic within a virtual reality context. *Deep Rift* was made for the *Oculus Rift Development Kit 1* VR headset in *Unity*, placing players inside a submersible vehicle. In *Deep Rift* the headset is used to look around a 3D cockpit interior and a controller to steer the vehicle. Within the 3D cockpit are four separate view displays for navigation. The main view is a central forward window providing a limited vision of a murky underwater cave. Adjacent to the main view are three smaller monitor displays. Each displays an alternative night-vision enabled view providing clearer vision of the surrounding environment. To successfully steer the submersible players must split their focus between the main view and smaller in-cockpit monitors, using the head tracking functionality built into the headset. This looking mechanic in *Deep Rift* was specifically emphasised by limiting player view of the 3D environment for an experience of tension and disorientation.

The second was a project partially created by fellow PhD student and colleague William Goddard; *Where’s My Spaceship* (2015) is a multi-monitor social multiplayer game. I did not develop *Where’s My Spaceship* but played it on multiple occasions and spoke to William about it at length. Together we co-authored a paper interrogating its multi-display design in *Designing Unconventional Use of Conventional Displays in Games: Some Assembly Required* (Goddard & Muscat 2016). *Where’s My Spaceship* design extended a two-dimensional game space across four separate monitor displays, for a four-player competitive experience. Through monitor positioning all players must physically move from monitor-to-monitor to track their ship, competitors, and objectives. Although created specifically for a social multiplayer context *Where’s
My Spaceship like Deep Rift intentionally limits visible environment information to create information gaps for a chaotic and competitive experience.

With these projects in mind, while summarising Chapter 3 results (see Muscat et al. 2016) I theorised how the first-person view mechanic in walkers could be further foregrounded. Through playing Where’s My Spaceship and Deep Rift ideas of a ‘multi-view walker’ surfaced. I quickly settled on a multi-view idea for a walker design and decided to experiment towards it in Unity. My intent was to significantly to heighten spatial and visual focus towards the game world and alter the experience of exploration.

Multi-View Prototype

The initial multi-view prototype of WORLD4 was created in the first week of an 11-week development period. Initial prototyping efforts centred on achieving an output of four first-person perspectives onscreen, suitable for first-person movement and looking interactions. I adapted a multi-display camera output script originally written for Where’s My Spaceship to create WORLD4. This utilised Unity’s multi-display output feature, which had been added natively at this time.

Through the multi-display script, the onscreen display was automatically divided into four virtual ‘viewport’ screens creating a ‘quad view’ based on display resolution. Each viewport allowed an individual in-game camera to be output within its region. With this working I attached four individual in-game cameras to the player character-controller, each fixed to an identical location and orientation capturing a similar in-game first-person perspective. The result was WORLD4’s quad-view: the player’s first-person view made up of four simultaneously rendered cameras output across four viewports, divided across the monitor’s display.
This initial quad-view design worked, however the amount of screen real estate devoted to each viewport was limited on a standard 1920 x 1080 resolution 24-inch LCD Monitor. Each first-person perspective was significantly reduced using a quarter of the screen when compared to a standard walker game. To accommodate this each camera’s field of view was modified through multiple small changes, narrowed from a typical 90 to 85 degrees horizontal, to 70 degrees. This reduced players’ peripheral vision but provided additional detail in distance observation, compensating for the reduced size.

Initial implementation of the multi-view prototype revealed exciting opportunities for using the four views in novel and creative ways. To fully realise the multi-view concept each view display would capture identical or different game world elements when observed e.g. 3D objects or parts of the explorable game level. This was how the title WORLD4 was conceived; four interconnected worlds.

![Figure 50: Screenshot, WORLD4 original prototype.](image)
The ‘red room test’ in the WORLD4 prototype. Image key – 1) Boxed room, opening visible in viewport 3; 2) A surrounding red boxed room with no visible shading; 3) A hidden white doorway opening.

To test these view prototype, I created the ‘red room’ level, an environment to test the effect of how different game world objects would appear and be negotiated onscreen. The red room consisted of a small area made up of multiple hollow boxes within each other, each with visible openings for movement between\(^2\). My overall rationale was to make differences between each viewport as obvious as possible when observed.

As I am focusing on my design of WORLD4’s views, I will discuss other techniques in the following sections. However, to summarise the underlying logic conceived while creating the red-room: Each in-game camera renders specific environmental elements according to a set of culling mask properties assigned (see Hidden Objects). These allow the inclusion or omission elements rendered by the camera, corresponding to an assigned ‘layer’. By determining what camera renders what environment elements what can be seen in each viewport is variable; it may not be visible or may appear different.

**Reflection on Initial Prototype**

On reflection my design revealed a significant deviation from existing types of walker game by introducing new atypical rules, and as the game world view is variable, movement and observation are problematised. This use of multiple views can be described as a core mechanic (Salen & Zimmerman 2004, p.316); while navigating each of the four viewports can be looked at independently, enabling a ‘spot the difference’ activity. As each may contain noteworthy elements there is no single

\(^2\) While creating the red-room I simultaneously experimented with other features including Culling Masks, Manipulation of Depth, and Colour Blending discussed below.
optimal view of the game world. In this respect I felt the design had successfully achieved an intensification of the conventional looking interaction but questioned if this choice would negatively impact an exploratory walker experience.

In response I decided to limit potential design scope in interactions and focus primarily on the mechanics of navigation and observation. There would be no contextual ‘use’ interactions or conditional rules e.g. in-world ‘triggers’ to effect movements during navigation. Instead emphasis would be placed on the perception of and movement through the game world environment.

In showing the prototype to colleagues and friends their interest suggested the multi-view design was immediately compelling. Through testing the red room prototype with friends, I observed a slowing of movement to ascertain differences between viewports, and vocal comments towards spotting and locating consistencies and inconsistencies. Based on this observation I assumed that an explicit ambiguity of information could surface by distorting the reliability of the first-person view and applying onscreen fragmentation of the game world. In addition, I assumed this could potentially evoke a presence of hidden information (see Costikyan (2013)).

Upon noticing these qualities and discussing with colleagues, I decided to experiment further with the theme of Player Focus in two alternate approaches to displaying the four viewports.

**Multi-Display Prototype**

After informally testing the initial multi-view viewport design I reflected upon the kind of ambiguity of information I had noted while observing players, referring back to Gaver et al.’s discussion of ambiguously designed interfaces:
For example, interfaces that are imprecise or contradictory are more likely to lead to multiple interpretations than ones that are clear and consistent; people who expect clarity and consistency are more likely to perceive ambiguity than those who do not (Gaver et al. 2003, p.236).

With these thoughts in mind, during the third week of development I decided to experiment with another permutation of the view design. Using the custom-made script, a multi-display version of the prototype was enabled, displaying each viewport on four monitors. My goal was to test the design through an alternative interface format, which I assumed could yield an interesting ambiguity of information. This prototype was moved to a publicly accessible area within the university for a quick informal playtest. Based on interesting observations during this test, I decided to follow up with two additional informal tests on different occasions at the university, engaging local students and staff.

While undertaking these multi-monitor informal tests, for comparison, I decided to informally test the single-screen version of WORLD4 at the university and at local game developer events. These informal processes were very useful in obtaining ‘bottom-up’ insights into the design and provided a space for conversation in the iteration process.

The multi-monitor testing configuration of monitors took inspiration from Where’s My Spaceship: each placed in a rectangular formation facing outwards, reducing visibility of each individual viewport and requiring physical movement to observe differences, while navigating in-game. To support this new context, gamepad controller options were implemented using a third-party Unity plugin.
I observed the unusual multi-monitor set up attracted individuals and groups of people visible drawn and interested in its novel presentation. I also observed an introduction of a social element, attracting spectators who often blurred in their role as players. In all of these informal tests I observed that the multi-monitor presentation appeared to impress the game experience as more of an interactive art-piece; to be moved around and viewed from different sides or focused on to spot visual subtleties. Furthermore, spectators often became involved in the exploratory gameplay with the controlling player, pointing out environment elements and discussing what they had seen or were seeing with others, frequently comparing differences or drawing attention to specific game world characteristics.
These social factors observed were very interesting in their own right, particularly in light of prior research (see Goddard and Muscat 2016). However, social factors introduced significant research complications that diverged from my stated research focus. One can consider the possibility of a walker game designed specifically as a shared or social experience, but for reasons of scope and focus I decided to abandon the multi-display version of WORLD4 within my research, although I may revisit it at a later stage.

Mosaic-View Prototype

In response to my Multi-Display observations I focused on the single-screen version of WORLD4 and considered alternate approaches to this design. My concern was the limited amount of game world screen-space per viewport while playing WORLD4 on a small monitor e.g. a laptop screen. I did not find this to be an issue during informal tests but was concerned with the possibility of it negatively impeding exploration. In response to this I decided to iterate on the view design, and with some assistance from William Goddard, experimented with another technical permutation of WORLD4.
Figure 53: Screenshot, WORLD4. Mosaic camera prototype.

Image key 1 - 4 are individual segments of a single first-person view that display alternate views of the environment. Lines mark the divisions between viewports.

The ‘mosaic view’ prototype merged the four first-person views together as one single first-person perspective, separated by a division in the centre of the screen. I intended to test the readability of the 3D game world, specifically in regard to perceivable differences between viewports as a combined view. Although the resulting effect was interesting, this introduced unexpected issues. The separating division between viewports (from the centre of the screen) was less obvious, and differences between first-person perspectives were no longer exaggerated or heightened as four distinct first-person perspectives. Consequentially the mosaic view was less than ideal for spatial exploration.

Although the multi-screen and mosaic prototypes were in their own ways more interesting than the original four-viewpoint version, it had already proven to work well during informal playtests and required little refinement within a reasonable timeframe.
Final View Selection

Although I considered the original four-viewport configuration as an optimal solution to challenges surrounding the design, I decided to undertake an additional informal playtest by hosting it publicly online. My intent was to assess its accessibility and overall impressions towards WORLD4’s, in the chance players might leave comments or feedback. These would also help me gauge public interest in response to its traits, such as its novelty and as an exploratory experience. This approach was largely inspired by Pinchbeck’s sharing of project work publicly on moddb.com with Dear Esther (2008) (see 2.1) and Korsakovia (2009) (see 4.1).

I posted a prototype version of WORLD4 for download online, on game platform itch.io. This version used the original view set up and featured a rough designed level. Without promoting the prototype, I left it publicly available for four weeks while I refined other designed features e.g. Exploratory Layout, Distinct Moments, and Memorable Iconography, giving time for the public to play and leave comments on the download page.

This version of WORLD4 received a positive response, including from game prototype video-bloggers GMVR (2016) and Williams (2016) who documented their onscreen gameplay and voiced impressions in video recordings. Although I observed both bloggers exaggerate their response to the multi-view aspect as weird and unusual, none expressed significant issues with the four-viewport design and both were engaged in exploring the prototype game world for a sufficient amount of time (15 to 20 minutes). These recordings eventually influenced my decision to adopt a remote player-study method discussed in 5.3.
Based on informal playtest observations and player comments, I decided the response towards the multi-view design was positive overall, and my concerns were not a significant issue. In addition, comments towards WORLD4 as conceptually creative and novel were also encouraging. Furthermore, on reflection of observed comments I am unaware this simultaneous viewport technique has been used in other games.

4.3.2 Hidden Objects

Conceptualisation

As discussed in the previous section, central to WORLD4’s design was the feature of four simultaneous views rendering the game world, thereby introducing a new mechanic to looking by fragmenting the first-person perspective. My intent was to follow the recommendation of drawing player focus towards visual spatial elements, by problematising a single comprehensive view of the game world, forcing a ‘spot the difference’ activity. To fully realise this concept creating the logic to enable variation between each viewport was paramount.

In conceiving hidden objects my approach was informed by the recommendation “fragmentation of information can provoke navigation”. My overall intent was to compel an adjustment of movements and view orientation during navigation, so players must move around the space in order to understand it. To achieve this effect, I experimented with a series of layers and culling masks, adding an underlying complexity to the design of WORLD4’s game world. Simultaneously, I experimented with manipulation and removal of depth cues to heighten the visual effect and further obfuscate the environment.
Culling Masks and Layers

The rules for how elements appear the four onscreen viewports in WORLD4 are as follows: an object may appear in all four, in three, or only in one viewport. During development of the ‘red-room’ prototype I conceived basic underlying logic to display or not display 3D objects in each onscreen viewport, first only partly constructing this logic. To achieve this, each camera’s ‘culling mask’ was modified, a property in Unity that allows the inclusion or omission of objects rendered or ‘culled’ by their assigned layer. In Unity all game-world objects are assigned a default layer; it was necessary to add multiple layers to assign 3D elements to, correspond to the four cameras.

Each of the four player-character cameras had different culling-mask properties assigned. All environment elements are assigned a layer in their properties. These determined what environment elements are displayed in each viewport. In the red-room prototype there were five layers; one per viewport to display a 3D object in each (4 total), and one to display a 3D object in all four viewports simultaneously.

In the second week of development while working on the Exploratory Layout I added four new layers for further variation in where and how objects may appear onscreen. These new layers would display an object in three simultaneous viewports but not in one. In total there are a nine environmental layers 3D elements could be assigned to in WORLD4.
Figure 54: Screenshot, WORLD4. Project in the Unity editor.

Image Key – 1) A pink cube object visible in the game world; 2) The object properties of the pink cube, assigned to the layer ‘Camera 2’. When viewed in-game the pink cube will only appear in the second (top right) viewport.

An example of how each of the nine environmental layers work with camera-culling masks is as follows: elements assigned to the ‘Default’ layer will be rendered by all four cameras and appear in all four viewports. Elements assigned a ‘Camera (no.)’ layer will be rendered by the assigned numbered camera, for example ‘Camera 3’. Elements assigned a ‘Not Camera’ layer, for example ‘Not Camera 1’, will be rendered by the three other cameras; an object assigned ‘Not Camera 1’ will be rendered by Cameras 2, 3 and 4 as it does ‘not’ appear in Camera 1.

Hidden Object Observations

Through my own initial gameplay tests and informal playtesting with friends and colleagues, I found this system of layers and culling masks allowed for significant concealment of game world objects. I observed player focus was intensified towards detecting differences between viewports, successfully creating a ‘spot the difference’ activity. I noted an observed impression of hidden information; the explicit fragmentation of objects seemed to suggest the presence of additional hidden objects that had not yet been observed.
Consequently, I observed players reducing their pace to scrutinise environmental details, however, I also observed that as players adjusted and compared each view single hidden elements tended to be missed or overlooked during navigation. Hidden objects appeared to yield a temporal effect in reducing player movement pace during exploration, fitting the theme of *Temporal Space*.

Although my implementation of hidden objects appeared successful during these initial informal tests, while simultaneously designing the *Exploratory Layout* I noticed significant limitations in implementation. Simply put, the relationship between hidden objects and onscreen views was very straightforward. Objects were either visible or not visible; it was just a matter as to what part of the interface they appeared.

Although my hidden object implementation was good for explicit concealment, these concerns highlighted potential issues in variety and versatility when designing an environment interesting and worthwhile to explore.

**Variation in Layer Use**

In response, I experimented with different approaches to presenting of 3D objects across the four viewports. One noteworthy addition was an overlapping of multiple, visually different objects sharing the same world-space position.

My first experiment was a basic 3D object dubbed the ‘multi-cube’. The multi-cube appears as a single cube object in each viewport, although differently coloured. To achieve this, I placed four cube objects in the same position each assigned a different material property and viewport layer. The resulting effect was the opposite of a concealed object; an object prominent across all viewports through an illusion of all appearing as one.
Figure 55: Screenshot, WORLD4.

Diagram lines added for definition of separation. The ‘multi-cube’ object in a hallway. This capture displays the extent of variability of views, such as the different colouring of the walls, floor and objects in the room.

This technique contributed significant variability to the environment, notably added complexity in how objects may be revealed and fragmented. Consequentially, I hoped this would influence player perception of the game world, making what is observed and missed also more variable. While developing the Exploratory Layout I further experimented with this technique, using the multi-cube idea to construct new explorable locations. For example, in Figure 55 the walls of the level are four different 3D models layered.

I also experimented with the technique when creating Memorable Iconography, through a split-appearance of different animations. One noteworthy example includes an undulating set of spherical objects, in the ‘sphere room’ location. These spheres use the same principle as the multi-cube but with an addition of different animations, resulting in a disorientating but visually novel effect.
Spheres animated differently, assigned to different layers. An extreme use of unlit materials for a flat-shaded 2D effect.

Once again, my aim in was to create visual variety and enhance differences between each viewport. I assume this would further compel scrutiny, interest in exploring, and furthermore, I wanted to impress a rule that there was no single optimal ‘view’ of the game world. The placement of hidden objects in individual views may suggest a theoretical ‘real’ or ‘true’ view to players. By adding layers of complexity such assumptions are complicated.

We may relate the characteristics of hidden and layered objects to Salen and Zimmerman’s definition of constitutive rules, “underlying formal structures that exist ‘below the surface’ of the rules presented to players” (Salen & Zimmerman 2004, p.139), like the activated triggers discussed in Theme 1: *Player Interactivity* (3.2.1). Layers and culling masks indicate a hidden complexity in walker games that players may not be aware of, even when visualised onscreen.

Potentially, this aspect could be explored further by introducing additional constitutive rules like timers or activated triggers, for example, walls disappearing at certain
intervals or under certain conditions. Additional conditional rendering may further push WORLD4 in a direction closer toward being on the continuum of puzzle games, a distinction encountered while creating the Exploratory Layout.

**Manipulation of Depth**

When creating the initial red-room prototype level I experimented with different material types. I quickly found standard lit shaded materials had significantly less visual impact when seen between viewports. As noted in Views, my intent was to enhance visual contrast between views, and to achieve effect I decided manipulate the surface material of objects.

I quickly experimented with surface materials using different shader properties; shaders determines how an object’s visible surface responds to (or produces) in-world light. To find an ideal visual contrast I tried ‘unlit’ shaded materials. Unlit materials do not capture light, essentially rendered as a flat, untextured object only visible in its 3D geometry outline.

![Figure 57: Screenshot, WORLD4 original prototype.](image-url)
While experimenting I noticed unlit materials had a significant effect when combined in volume e.g. applied to all surfaces within a room. Any light present was diffused, and surface geometry blended, removing all visible contours and edges. The effect was a flattening of 3D depth. Through self-play-testing I noticed having to adjust my viewing angle during navigation to ascertain the 3D form of objects and spatial boundaries of rooms. I realised this technique had powerful potential for concealment, beyond just onscreen fragmentation.

I experimented further with this technique testing emissive materials, which modify an object’s surface into one that emits light. Through blending and contrasting materials, I found perceivable depth cues could be significantly manipulated within the explorable game world to enhance concealment.

*Figure 58: Screenshot, WORLD4.*
For example, Figure 58 captures a later version of the red-room test level, using a different set of materials. A grey emissive material (replacing an unlit red) can be seen on all surfaces of a large room, blending and blurring the seams between floor, walls and ceiling. Lighting in this scene is entirely diffused because of these emissive surfaces; there is a complete lack of shading. Depth can only be ascertained through visible changes in scale e.g. objects growing or shrinking during movement, relative to player position and orientation.

As the scene is ‘flattened’ visual contrast in shape and colour characteristics are made more prominent. Through my own gameplay experience I found negotiating reduced depth meant these contrasting elements became important reference points. I found this technique fulfilled my goal in framing the game world as something that must be moved around and looked at from different angles in order to understand it.

During informal playtesting a colleague compared this aspect of light and space to work by artist James Turrell, specifically in regard to my use of diffused lighting with flat geometric surfaces to manipulate space for an emotional effect.

While developing WORLD4’s Exploratory Layout and Distinct Moments of Discovery I further experimented with different combinations of materials and level elements to subvert navigation. In the example below, a narrow corridor features a pink ceiling and floor, and blue walls. At the end is a vertical shaft (depicted) using a pink colour, blended with the floor. Beyond it is a double vanishing point appearing as a vast corridor. It is difficult to perceive the vertical drop because of this combination of
blended materials and surfaces, transforming an architecturally simple environment into one that conceals its spatial dimensions and contents.

In addition, while creating *Memorable Iconography* I found depth manipulation could transform a 3D object into appearing as two-dimensional when viewed from a fixed position. For example, in the sphere room location (see Figure 56) displays four identical rooms. Each has its ceiling, walls, floor, and spherical objects inside coloured using different unlit (does not capture light) and emissive (emits light) materials. In effect the spherical objects appear as 2D circles from one angle when entering. The only indication of depth in this is through a two-tone red in the top right viewport, revealing a division between ceiling and floor.

![Figure 59: Screenshot, WORLD4.](image)

Image Key – 1) A walled corridor with vanishing point; 2) A vertical drop in the corridor, difficult to perceive due to the flat shading; 3) A moving red sphere travelling down the corridor. Dotted lines added for clarification.

During informal testing I observed an alteration of the theme *Player Focus*; players scrutinised the game world and its contents as a perceptually elusive object of
curiosity. However, I observed WORLD4 was at times challenging to negotiate and noted a degree of disorientation. I was concerned a significant disorientation effect could discourage exploration. In response I made efforts to balance the effect while designing WORLD4’s Exploratory Layout and Memorable Iconography. If successful I assumed potentially negative disorientation would be adjusted to and overcome or become a subject of interest in itself channelling Caillois’ (1961) Ilinx - disorientation as its own source of play and pleasure.

4.3.3 Exploratory Layout

Conceptualisation

As discussed in 4.2 WORLD4’s design was intended to be spatially focused. Following initial prototypes, it became clear the viewport technique added versatility in how the explorable environment could be designed, as entire parts could be concealed or obfuscated across simultaneous views. In light of initial prototype tests discussed in Views and Hidden Objects, when conceptualising WORLD4’s explorable game world I first focused on the recommendations of allowing players to slow down and set their own pace and to indulge in background elements.

While adopting this focus I considered the theme of Temporal Space; reduced spatial temporality during exploratory gameplay, through environmental details and obstructions to draw attention and reduce navigation pacing, and visual occlusion to frame the game space as a subject of aesthetic pleasure and exploratory enquiry.

With these considerations in mind level design traits were brainstormed and quickly implemented and tested over the 11 weeks of development. Much of WORLD4’s game space was not pre-planned or designed from the ‘top down’ through planned sketches or diagrams but created through a more bottom-up approach consisting of small
design iterations. My initial level design prototype expanded from the red-room prototype discussed in the previous sections, through a quick ‘grey-boxing’ or ‘block-out’ technique.

Grey-boxing is a level design prototyping approach, essentially a 3D sketch quickly blocking out a game level using primitive 3D geometry. When developing the level design from the initial prototype I created simple corridors and rooms using primitive 3D geometry, moving between Unity and free 3D modelling software Blender. In these initial stages I primarily experimented with spatial dimensions, determining appropriate characteristics and relative scale of the game space to the player-character’s narrower field of view.

Limitations in time and resources forced me to consider level design complexity and scope could be constrained. In walker games studied, environments adhered to a theme in setting or place. For example, walkers discussed in Chapter 3 are architecturally and geographically constrained: office corridors, a family home, seaside paths and caves, a small island bordered by an impassable ocean. By selecting a self-contained environment with geographic or architectural constraints, creative choices may be restricted and directed, reducing scope and production costs (i.e. time).

A driving motivation of mine was to create an unusual, uncanny and strange environment, that was stimulating to explore, and stylistically and spatially ambiguous. Although WORLD4 did not have storytelling focus, I desired to create an atmospherically evocative environment, drawing upon design theories of an evoked space by Pearce (2007) and Jenkins (2004). Similarities may be drawn between this and traits of DIY walkers described by Street (2016) as atmospherically rich “quiet, contemplative, unsettling experiences made by individuals or very small groups”.
Another factor I considered was graphical complexity. Working primarily alone over 11 weeks, I could not achieve the same degree of fidelity as the walkers studied. Instead, taking inspiration from DIY walkers, I considered an environment theme conducive to simplistic geometric stylings, which would allow for quick iterative configurations during prototyping and place less emphasis on granular detail.

While brainstorming I thought of various environment types conducive to slowing down people’s movement pace, and side-tracking navigation through eye-catching background elements. While brainstorming I constructed a rough criteria including *Temporal Space* factors: a space geographically or architecturally confined; repeating or looping in on itself; conducive to easy navigation movements and presenting opportunities for branching and variety. In addition, I also considered elements of *Player Focus*, including perceptually interesting sights and vistas within the world, that could compliment my chosen type of bold, high-contrast surface materials discussed in *Hidden Objects*.

*Figure 60: Screenshot, WORLD4. Early prototype.*
An early ‘grey box’ level under construction. The architectural stylings of the level were an early attempt at experimenting with the ‘explorable empty mall’ concept.

For these reasons, in week 3 of development I decided to loosely adapt an empty ‘shopping mall’ theme as the environmental setting for WORLD4. The idea of a shopping centre or mall was an attractive and personally interesting to me and fit well with my criteria. It also seemed like a unique basis for an environment to explore in solitude. I did not expect players to explicitly pick up on the mall reference but felt that certain layout and stylistic traits might create a familiar sense of place, capturing an element of evoked space. For reference I created a mall image catalogue and looked through sources including Eckhart (2014) for photographic and illustrated documentation capturing layouts, interiors, and architectural traits.

We can easily imagine a more narrative or political walker game that speaks to themes of capitalism or nostalgic memories. However, my focus was specifically towards adapting and abstracting spatial architectural traits of malls for my walker design context. These included harsh geometric angles, use of columns, high ceilings, long corridors, decorative finishes (e.g. wall light fittings), mixed materials (e.g. tiling, concrete, plaster), diffused skylight lighting and a neutral colour palette. Photographs and video documentation helped adjust the scale of the game space to a rough approximation of a mall, and for a general sense of ambience in motion. With these conceptual factors in mind I designed the following elements:

**Defining Core Spatial Traits**

During the initial grey-boxing phase, two different layouts were created in Blender software. The first consisted of a series of diverging, snaking pathways akin to level architecture in *The Stanley Parable*. After a few days of development, I tested the layout in *Unity*. I found the design was successful in a maze-like occlusion effect,
however, the layout was far too complex and confusing to navigate through four viewports. One significant issue was a lack of variation and definition in spatial dimensions e.g. room sizes.

In response to these issues I decided to scrap the first grey-box prototype and developed another, instead focusing first on creating distinct rooms (discussed further in Distinct Moments of Discovery and Memorable Iconography). Rooms would be self-contained, allowing for easy layout modification on the fly, in room placement and pathway links. Drawing upon visual occlusion and shifting room scale use in Dear Esther I created a central mall ‘atrium’ location, branching from the red-room. This location was distinct, large in scale, and contained the most obvious mall visual motifs e.g. glass banisters, shopfronts, and a visible multi-story interior.

![Figure 61: Screenshot, WORLD4.](image)

The central ‘mall’ atrium location in the game world in a more final form, with materials added. Characteristics such as the balcony and ‘shopfronts’ are visible, as are abstract geometric forms such as the large omnipresent red sphere that travels upwards. The internal atrium often found in malls was exaggerated as a spacious architectural chasm.
Following this I built out the level design from the atrium location, quickly grey boxing interconnected rooms. This was guided by inspiration taken from *Gone Home* and *The Stanley Parable* in networking branching pathways outwards and around rooms from a central position. Despite influences from prior walkers studied, I characterized the environment in a direction closer to more heavily stylised DIY walkers, informed by my choice in surface materials. Architecture was abstracted to basic geometric shapes to exaggerate its artificial, stark and unlived-in characteristics for a surreal edge.

Using materials discussed in *Hidden Objects*, I experimented with applying various combinations to the simple 3D geometry e.g. gaudy, bold, stark contrasting colours to enhance surfaces and give the world a distinct visual aesthetic. Use of emissive and unlit materials reduced the need for lighting elements (e.g. point lights, area lights, spot lights) and allowed for a diffusing of depth cues when combined appropriately. During this I simultaneously designed in other elements including *False Walls and Openings, Hubs and Recurring Locations*, and *Balancing for Visual Occlusion*.

**False Walls and Openings**

As noted, the viewport techniques added versatility in how the game environment could be designed. During the first week of development I implemented false walls, a core, basic occlusion technique to test viewport differences with movement navigation i.e. to block and direct movement. My first consideration was the visibility of walls within a confined single viewport.

I experimented with scale in the initial boxed location within the red-room (which became the starting location in *WORLD4*); a plain, enclosed boxed space but large in scale. A single wall can take up a player’s entire view without much space to move around. This is an “intimate space” defined by level design theorist Totten (2014,
p.120) as an environment comfortable and accessible for interaction; it is difficult for details to be missed.

Figure 62: Screenshot, WORLD4

The in-world starting location, formerly within the red-room test level, featuring an opening in viewport 1 and visible false walls in the other 3 viewports.

In adjusting the player’s starting orientation, to reveal the false wall requires a full 180 degree turn by the player, revealing a prominent visual threshold; “linear elements that mark a transition from one continuous area or condition to the next” (Totten 2014, p.140). In this test environment the presence of false walls is communicated through the activity of passing across the threshold boundary.

I experimented with further complexity in the red-room layout adding openings and varying surface materials. During initial informal tests I observed that players quickly understood how to negotiate and detect false walls in order to advance, despite a reduction in depth cues. I found my obvious use of false walls and openings provided a basis for guiding navigation, which could be expanded on as I developed the layout.
While creating the mall-inspired atrium location I chose to intensify this technique, placing false walls throughout the location for a significant visual fragmentation and occlusion effect. I intended for this to have a temporal effect, assuming this would increase the likelihood of openings being missed, extending the experience of discovery during exploration. I also assumed this would be conducive towards my repeating layout structure; on return a player may notice an opening or simply stumble through a false wall.
I experimented further with this technique in adjacent room locations. The ‘Green Room’ is one particular example (see Figure 64): I significantly increased the complexity of false walls by introducing multiple openings in one location. I implemented single-sided walls using inverted geometry and flat 3D ‘quad’ polygons. Unlike a polygonal box, these only render one side or ‘face’ as its surface, as back of it has no surface data to be calculated and rendered and is therefore culled; if viewed from this angle the object appears invisible. These were useful for blocking vision once passed through, an effect akin to an open then closed door, without a visible animation.

During informal testing I observed a successful temporal effect in reducing navigation pace, as players tended to slow down to locate and negotiate false walls. I observed that players also commented towards the possibility of additional false walls, and
significantly reduced their movement speed to scrutinise surroundings, perhaps suggesting hidden information.

**Balancing for Visual Occlusion**

During development testing, a colleague compared these stylistic and spatial traits to first-person puzzle game *Antichamber* (2013), whose environment is constructed as a spatial puzzle, using non-Euclidian architecture and visual illusions to challenge navigation and problem-solving. *WORLD4*, although not intentionally designed as a puzzle game, does share similar visual and level design traits, most notably my use of flat-shaded 3D visuals and elusive architecture to problematise spatial and visual observation.

In light of this comment I reflected on my work-in-progress level and noticed my choices mirrored principles within both maze and labyrinth design; alternative methods of structuring and occluding an explorable game space. We may distinguish between the two by drawing upon Walz’s (2010) definitions.

A labyrinth “is a play-ground best conceived as a spatial device for creating linear experiences that gestures some degree of disorientation but doesn’t require the player to make numerous choices in order for a game to progress” (Walz 2010). A labyrinth approach is visible in *Dear Esther* level design which directs and structures player movement through winding, architected pathways.

Comparatively, a maze “is a play-ground for non-linear play that seeks to disorient the player and requires spatial decision-making as a necessary condition of game progress” (Walz 2010, p.192); or alternatively, an elaborate spatial puzzle (Totten 2014, p.114). *Gone Home* use a maze-like design to pace navigation through progress gating (i.e. hidden keys and locked doors). *The Stanley Parable* utilises labyrinth and
maze elements to conceal branching points in winding pathways. Both examples fit Nitsche’s definition of ‘logic mazes’: a “conditional maze that depends on changing access conditions that shape the available space” (Nitsche 2008, p.177).

A core trait of walker design identified in Chapter 3 was an absence of conditional rules as a gameplay focal point (although present in an algorithmic component e.g. activated triggers); a distinguishing factor between first-person puzzle games and walkers e.g. walker-like title SOMA (2016). Although I intended for WORLD4 not to have conditional rules I observed a similar, maze-like effect during informal testing.

Elements including a reduced depth cues, false walls, and hidden objects, lead to incidents where parts of the environment were perceptually blocked.

During informal testing I observed players were unaware of variable geometry and surfaces, even when noticed and looked at e.g. if these were false walls, openings, or even a space with depth to be entered and traversed. Observations suggested a degree of ‘gating’ at work in this design, although the ‘gates’ are always ‘open’ and must be first noticed to be negotiated. Unlike conditional rules this was perceptual and not a traditional logic gate. In a way this suggests a blurring between perceptual and logic gates in WORLD4, which destabilizes conventional notions of game “mechanics”.

To me, these observations highlighted an opportunity and challenge in creating an elusive and disruptive game space that could be conducive towards ambiguity. Players unable to notice these ‘perceptual gates’ over time could become discouraged in their exploration efforts. I did not want to remove this perceptual friction as I felt it was desirable for spatial-ambiguity and moments of discovery. Instead, I decided to better accommodate for possible frustration by configuring the level layout into a
denser hub-like environment (see below) to increase opportunities for players to notice differences, and through landmark elements (see Memorable Iconography) to guide observation.

**Hubs and Recurring Locations**

In response to my observations and thoughts I returned to reworking the explorable game world layout, specifically its looping trait, drawing on Gone Home, The Stanley Parable, and Proteus as level design reference points.

I decided the layout would be structurally ‘open’; environment locations are discoverable at any given time, without a final ‘end’ location or conditional blockages. In addition, without a story focus there were no narrative requirements for a definitive conclusion. Instead, I decided to place emphasis on ongoing navigation of the space through the looping structure, to determine success and failures in engaging player exploration over time.

In response to challenges noted I adjusted the layout of the mall atrium location as a more explicit ‘hub’ location, providing diverging pathways but allowing return. I introduced dead-ends and removed connections between branching rooms to direct player navigation back towards the hub, with the assumption that on return a player’s prior knowledge may lead to a reassessment of the location.

This choice was informed by level design theorist Totten’s description of game level hubs as a “prospect space” (2014, p.122) allowing players to survey potential ‘prospects’ or elements that surround them from one location. Prospect spaces have players look for spatial advantages, for example pathways or routes, and heighten their awareness of the surroundings. According to Totten (2014) the ability to return in hubs allows to players to reaffirm or question past memories of a location, and act
upon openings or paths not yet travelled. I identified this technique was conducive to
my walker design recommendations: Allow for moments of thinking and consideration
of the world; Player exploration is an ongoing process of interpretation and
understanding.

I assumed players would likely miss many game world elements due to my
combination of occlusion and fragmentation features. I did not see this as a negative
trait, however I was concerned in its effect over time. I assumed players would become
frustrated in not noticing numerous perceptual gates and lose interest in exploring. I
decided the hub required further ‘balancing’ alterations in layout design, in maintaining
obfuscation but increasing potential discovery opportunities on return.

Figure 65: Screenshot, WORLD4. Project in the Unity editor.

Image Key – 1) The central hub ‘atrium’ with multiple branching
rooms and pathways clustered around it; 2) The ‘multiroom’; 3) The
cone room; 4) The sphere room; 5) The starting room; 6) The
underside corridor.

Adjustments included bringing many of the (modularly designed) rooms inwards,
closer to the hub location, and reducing pathway lengths. The final layout in WORLD4
included multiple rooms and corridors adjacent and branching outwards from the ‘hub’
(see Figure 65). This was a significant change from extended and linked branching pathways in previous versions. I assumed more densely packed level elements around the central hub location, would increase any likelihood of these being discovered over time, whether by intuition or chance. I was unsure how successful this would be and hoped it would extend exploration time, in a way that was not awkwardly cluttered.

4.3.4 Distinct Moments of Discovery

Conceptualisation

As discussed in 4.2, there is no narrative premise in WORLD4. Instead my primary focus was towards the design of the explorable game environment and a heightening of ambiguity. While designing the exploratory layout I found issues in my initial approach, and instead redesigned the level focusing on self-contained rooms. These were created as individual, distinct locations, and not pre planned in design but through a cycle of quick in-engine 3D modelling.

Using my recommendation “aim for curiosity and provoking imagination” I intended to give each room a distinct sense of character through specific stylistic and architectural traits, quirks, 3D objects and materials. I assumed this choice would assist players in differentiating parts of the environment during navigation (a problem I found in early level iterations), and potentially foster moments of discovery as players revealed new rooms and their contents during exploration activities.

I intended to provoke further exploratory navigation, and a feeling or sensation that may prompt a more narrative interpretation. The desired effect in this approach was to support the recommendation: “player exploration is an ongoing process of
interpretation”, informed by the theme of Ambiguity. Elements considered are as follows:

**Evocative Districts**

When considering stylistic choices as expressive and atmospherically distinct, I drew upon the theory of an ‘evocative’ space discussed by Jenkins (2004) and Pearce (2007) (see Chapter 3, Player Focus). Their theories posit that through specific methods of visual and spatial presentation, a space can present an idea broader than the architecture itself and help a player determine how they should feel.

I wanted players to feel a sensation of curiosity during exploration, particularly in a desire to piece together the workings of the game world, and a feeling of wonder during moments of discovery. To achieve this, I experimented with various room configurations to evoke an emotional response. My first attempt was with the stark and empty red-room test level, specifically designed to create a feeling of isolation and desire to see what is beyond by layering closed boxed rooms. Following this, I spent over a week designing the mall atrium, to be a distinct, vivid and surprising moment of discovery.

When constructing the mall atrium’s appearance, I made specific choices in a use of decorative and architectural motifs to convey familiarity despite it’s fairly abstract stylisation: long walkways, balconies, bannisters, glass shopfronts, and a multi-storied interior. Once I was satisfied with these familiar motifs, I decided to exaggerate traits for an more expressive, vivid effect. I warped the architecture towards a more surreal appearance, extending the multi-storied interior shaft to appear ‘endless’, adding bright pink and blue materials, and an unexplained animated red sphere within the interior chasasm (discussed in Points of Interest).
My intent was to compel a response from players through juxtaposition, in presenting familiar architecture and contrasting materials and abstract shapes, that may potentially compel a response. During informal testing I observed these stylistic choices to be successful in this regard, as players commented towards the mall location as visually interesting, uncanny, and mysterious.

With these lessons in mind, when creating other locations and rooms, I decided to distinguish each stylistically through a similar juxtaposition approach. We can describe these differently stylised locations as ‘districts’, derived from Lynch’s *The Image of the City* (1960); sections within a location where the observer enters and notices an identifying characteristic different to the last.

I applied a series of contrasting elements per district, most notably in layout configurations and colour (which I discuss below) to highlight spatial thresholds, marking a linear, distinct transition between areas. I assumed these choices would convey individuality per-location despite their simply designed 3D geometry, and potentially compel comparison thereby prompting an interpretive response.
My first attempt at threshold juxtaposition between neighbouring districts was to re-stylise the prototype red-room location in response to the mall location’s visual traits. The red-room’s materials were changed from harsh, bold red colours to a more muted, sterile, whites and greys. My reasoning was to make the starting location feel less outwardly hostile, instead, more mysterious and solitary, and to create an interesting visual distinction: a mysterious empty-void like ‘container’ juxtaposed to a sensorially stimulating and complex atrium, with gaudy colours and multiple openings.

**Colour Blending and Contrast**

As part of my approach to creating *Evocative Districts* I employed basic colour theory for both emotional and practical purposes. Discussed within a level design context by Totten (2014, p.176), all colours relate to one another and carry metaphorical and emotional associations. Combinations of colours that blend and contrast may embed symbolic meaning and carry strong pre-existing, culturally specific metaphorical associations. Colour groups can create “analogous” colours for a “harmonious atmosphere based on a particular mood”, and “complementary” colours that are opposite and can create contrast (Totten 2014, p.177).

When selecting colours, I decided each district location would contain a fixed selection of 3-6 colours; I decided on a limited selection to keep a more consistent visual theme and to exaggerate a *Manipulation of Depth* effect when I felt necessary. Per-location, colour choices would often involve a unique colour for walls, ceiling, floor (although sometimes blended), and noteworthy objects.
A stark void location discoverable within the game world, which makes key use of colour and view juxtaposition.

Key to the colour selection was contrast, the “juxtaposition of objects such that one is meant to be directly opposite another in some quality such as size, colour, shape, or style” (Totten 2014, p.178). Contrast was employed throughout colour selection, used to guide player view for navigation purposes, and evocative juxtaposition between districts. To amplify visual contrast separate materials per colour choice were also applied. Each material has a different shading effect e.g. standard (shades when lit), emissive (produces its own light) and unlit (does not capture light and as a result is intensely bright).

For example, in Figure 66 above, the multi-coloured cube was chosen for contrast to the stark grey in the starting location, leading to the opening. Blue and pinks beyond also contrast against the white and grey. This combination of three kinds of colour
variations creates a basic visual hierarchy; the higher the contrast in colour combination, the more it draws attention towards itself.

In addition to guiding navigation, observations during informal tests suggested blending colours could enhance concealment, most notably when blended and combined with techniques including false walls and openings, for example, the Green Room (see Figure 64). With these in mind, I assumed specific combinations of contrasting and blending colours could lead to a perceptually dazzling or disorientating Illinx (Caillois 1961) effect, however I was uncertain whether this would be desirable for the purposes of an exploration experience.

Arrivals

While creating visual elements, I considered how game level architecture could also apply juxtaposition principles for an emotional effect, to further enhance a dramatic shift in ambience. Early experimentation as discussed in Exploratory Layout mostly concerned changes in room placement and scale, pathway pathing and length, and false wall locations. When redesigning the layout, I considered how openings, pathways, and room scale could be used specifically to foster a sense of anticipation or interest in discovery during navigation.

One such method I applied was a perspective trick to guide player view and movement towards a ‘framed’ horizon, beyond a spatial opening that occupies the middle-ground. This technique is described by Totten (2014) as an ‘arrival’; a use of “sight lines, pathways, dramatic lead-ups, and ambiguity about the nature of where you are going” (2014, p.109), communicating a destination before it is reached.
My implementation derived methods from Gone Home’s use of doorways and corridors, and scenic vistas and cave openings in Dear Esther discussed in Chapter 3, Player Focus. Both constrain peripheral version through 3D geometry, to place emphasis on a focal point on the horizon. A framing effect achieved through arrivals is described by Totten as “the use of foreground elements to surround the view of something important in an environment as though it were a frame” (2014, p.179).

In addition, I found through experimentation that by extending a corridor an arrival technique can be enhanced, drawing out movement pace to create a dramatic build-up before arriving. As with openings, there is ambiguity during navigation as to where the player is going and what is beyond, because of the surrounding visual occlusion effect.
In addition, I experimented with room scales for an emotional effect. Corridors were reduced in width, narrowed for spatial scarcity to ‘funnel’ player vision. In level design theory Totten (2014) suggests such use of narrow spaces can have a dramatic effect by removing the player’s freedom of movement and blinding their peripheral perception, creating an element of tension, vulnerability and claustrophobia, and heightening anticipation.

Although I did not intend for feelings of vulnerability, I did seek to convey tension and a degree of claustrophobia, to heighten possible anticipation during the arrival. By controlling sight lines in a strictly linear direction, reducing peripheral vision towards the vanishing point, and extending transitory navigation, I wished to emphasise reaching the horizon as a significant moment of discovery.

![Figure 69: Screenshot, WORLD4.](image)

An extended corridor leading to the ‘hub’ atrium past the threshold. Note within the horizon vanishing point a small red spherical object in the fourth viewport.

My first attempt in implementing this was the transitionary corridor between the starting location and mall atrium (see Figure 68 and Figure 69). Using a false wall in the grey
starting location I blocked view into the mall atrium in all but one viewport (see Figure 68). I extended the corridor and pushed the horizon further back in distance to an opening across the atrium chasm (see Figure 69). These obfuscated the horizon even though it was visually distinct in colour contrast. My intent was to create a gradual build up to reaching the opening, then once the false wall threshold had been passed, surprise in a sudden change in the three other viewports, followed by another anticipatory build up to the atrium. As a focal point in the horizon I placed a red spherical object in the distance (see Repeating Symbols).

During informal testing this seemed to yield a desired effect: I observed players remarking with interest towards the atrium while in transit. I did however alter the corridor length and opening ‘frame’ size on multiple occasions, as I was uncertain what was ideal for an anticipatory (and not tedious) effect.

Furthermore, I observed players once ‘arrived’ move straight towards the red sphere that I had placed in the horizon, bypassing multiple openings and false walls. It was difficult for me to discern if this was achieved because of the extended corridor arrival effect, however, this revealed opportunities for further concealment in the level design to potentially sustain moments of discovery over time.

**Blind Corners and Extended Corridors**

In response to player activities observed during informal level tests I added an additional element of level concealment, with the assumption it would likely be missed, but eventually discovered due to the looping Exploratory Layout. I implemented openings and rooms hidden in blind corners; an aspect adapted from maze design that plays on concealment and misdirection, using harsh 90-degree angles.
My initial experiment was the placement of the Green Room (see Figure 64) location within the immediate left (see Figure 69) of the extended corridor into the atrium (see Figure 70). I assumed the likelihood of it being noticed was slim, and players would instead move towards the horizon seen during the arrival. Placed at the end of the extended corridor, the room opening was well outside of a players’ peripheral vision, requiring a full 90 degree turn to notice, in addition to a false wall obfuscating it in all but one viewport. During an informal test, players were observed to pass the Green Room while navigating; most did not appear to notice it, or if they did, chose not to explore.

![Figure 70: Screenshot, WORLD4.](image)

The immediate exit left of the extended corridor in Figure 69, a ‘blind corner’ concealing the Green Room location.

I added few additional blind corners to WORLD4, including the passage leading towards the red Triangle Room. I found this technique was effective in concealing the horizon by occluding the destination, for example having a pathway take multiple hard 90-degree for an architectural ‘dog leg’ effect. In addition, I found blind corners could be easily complicated through colour blending, as even the contrasting colour of the Green Room did not appear to be sufficiently eye-catching.
I had some concern that too many blind corners could significantly confuse the navigation layout, like in my original prototype level. Ultimately, I was unsure if this would happen or if such a disorientating effect would be undesirable within this exploration context. While considering this I reflected on Dear Esther’s cave-network, as an example I believed to be successful in creating an interesting and engaging llinx (Caillouis 1961) effect in its winding and often blind level architecture.

In light of this I assumed, at the very least, this element could result in moments of surprise when discovered and successfully negotiated.

**4.3.5 Memorable Iconography**

**Conceptualisation**

While creating WORLD4’s game world, specific attention was not only placed towards the layout and stylistic traits of the level architecture, but also the content within it. Both the themes of Player Focus and Ambiguity in Chapter 3 highlight the relevance and importance of in-world objects, as artefacts acting as material sources of information and aesthetic pleasure within walker game experiences. This was guided by the recommendation: “player exploration is an ongoing process of interpretation”, informed by the theme of Ambiguity.

Informed by these design themes, I created artefact elements to populate the environment while constructing it, creating 3D objects for locations or creating locations around particular objects. I intended objects to have two types of potential applications: to be concealed and discovered or to be visually prominent and draw attention. I decided objects must share the same trait: their characteristics had to be distinct enough to remember; visually, spatially, and audibly.
I felt this factor was vital as these objects were intended to be sources of interest, to support an interpretive reading in an experience without story focus and information. During development, as I created and deployed these 3D objects I realised by repeating visual and spatial traits I was constructing a series of in-game iconography, not dissimilar to walkers such as *Dear Esther* in their use of recurring visual icons as symbols discussed in *Designed Ambiguity*.

Elements of memorable iconography are as follows:

**Points of Interest**

When creating artefact objects, I continued to use the minimal abstract styling and it applied to geometric objects as artefacts in the environment, as a way to unify the overall aesthetic and game experience. My goal was to have distinct and memorable objects in the absence of granular visual detail, ideally as sources of interest during player exploration.

This was informed by my identification of points of interest in Chapter 3 *Player Focus*; environmental objects containing narrative information and acting as sources of interest for exploration. As there was no narrative focus, points of interest did not need to convey narrative information. Instead, I concentrated on their ability to attract attention and ideally gesture towards an implied significance, even if not narratively explicit. Similar to *Evocative Districts*, as I was working without spoken audio or onscreen text this effect would be achieved through their individual stylistic traits.

The first point of interest object I created was during development of the mall atrium, while adding surreal traits including an ‘endless’ multi-storied interior (see *Evocative Districts*). To draw attention towards the scale of the environment and further enhance my intended unusual and mysterious atmosphere, I added a large sphere, a simple
primitive 3D object filling the entire chasm. To draw attention towards the endless ceiling and empty the chasm, I gave the sphere an animation, travelling on a looping path upwards through the interior. In addition, I chose a distinct emissive red material for some contrast against the angular pink and blue surroundings and added a droning audio effect discussed below in Location-Based Audio.

Figure 71: Screenshot, WORLD4.

The central hub atrium and travelling red sphere.

The animation element also meant this point of interest was not in plain sight, withholding it for specific moments in-view. As I created the red sphere I hoped its traits would be memorable in their own right, and punctuate the arrival moment, possibly fostering a sense of wonder or curiosity as an unexpected discovery.

Following the red sphere, I created additional points of interest, each created using basic 3D geometry and differing in traits. I hoped distinct visual characteristics and stylistic deviations between each would compel players to seek them out, as discoverable and memorable ‘sights’ within the game world, and as their own reward for exploration and observation.
Although most points of interest in WORLD4 were created for particular locations, certain locations were designed specifically for points of interest. In one example, the hidden ‘sphere room’ beyond the concealed Green Room (see Figure 64) contains an unusual inverted sphere object, suspended in an empty void (see Figure 72), concealed as a significant discoverable object. The object consists of two basic inverted spheres shaded with unlit materials, giving it a flat 2D appearance. Each sphere is animated and expands and contracts, scaling into one another in a pulsating undulation and complemented by ambient audio, a dull heartbeat sound. The room was created as a container for the sphere, featuring unlit materials to mask its edges and give the object a significant presence.

Figure 72: Screenshot, WORLD4.

The ‘sphere room’.

I assumed such a combination of traits in shapes, colour, lighting and audio would provide a ‘wow’ moment distinct and unique from all other locations, rewarding a curious, keenly aware, persistent, or lucky player with a more memorable sight.
Following this, I created other points of interest including other primitive geometric objects with static, undulating, or traveling animations or effects.

**Landmarks for Wayfinding**

When constructing points of interest, I considered those visible and prominent and *not* concealed artefacts as potential landmarks. These are distinct focal points acting as points of reference like guideposts or markers, to direct and assist player navigation. Standard in architectural design theory, landmarks are discussed by Lynch (1960), who advocates their use in creating spatial legibility. Within a level design context, Totten notes that Landmarks call attention towards themselves through a relationship of contrast to their surroundings (Totten 2014, p.136).

My first intended landmark was the ‘multi-cube’ discussed in *Hidden Objects*. Originally created as a layering experiment, the multi-cube was adopted as a landmark due to its distinct visibility across all four viewports (see Figure 66). I placed the cube within the starting-room location, next to the false wall opening leading into the arrival corridor (see *Distinct Moments of Discovery*). This landmark was intended as a point of relief for players who I assumed may be disorientated or confused when navigating the void-like room.

During informal level testing I observed the multi-cube to be successful in its assigned landmark role, which suggested the potential strengths of point of interest artefacts as ideal landmarks. Their distinct traits could be identified from multiple angles and distances and be easily remembered as a navigational marker.

While creating *Evocative Districts* I also implemented specific architectural traits for a landmark effect, as spatial anchoring points for a player’s ongoing exploration activities. For example, a multi-cube can be seen on all four viewports and directs
player focus towards the opening, allowing players to potentially move around the void so long as the cube is in sight. In the hub location, the large ‘mall’ atrium acts as a spatial landmark to signal a point of convergence in pathways, and as a memorable point of return in the looping, and potentially disorientating layout.

Repeating Symbols

While implementing points of interest I decided to duplicate and re-use artefacts (first the red sphere) to quickly test their effect in different locations. However, my intent quickly changed as I realised this closely aligned with the Chapter 3 theme of Designed Ambiguity, specifically the re-use of modular, repeatable objects in Dear Esther. As discussed, Dear Esther uses repeating objects as suggestive symbols of narrative information e.g. circuitry diagram graffiti and candlelit vigils.

I assumed that by repeating point of interest artefacts there was a possibility that by association they might impress an implied symbolic meaning, a concept discussed within the context of game level art by Pinchbeck (2009).

Environmental symbols in level design are discussed by Totten (2014) as an effective method of teaching game mechanics and conveying information so long as they: 1) have a unique appearance; and 2) are repeated so that players learn through repetition (Totten 2014, p.172). Following the theme of Designed Ambiguity, I assumed such repetition might lead to interpretive ambiguity, however, without storytelling focus I was unsure my implementation would have this type of effect. Furthermore, I was unsure if such simple repetition could imply symbolic meaning.

To experiment, I decided to add additional repeating objects in different contexts. These included two different variations on the red-sphere artefact discussed in Points of Interest. One was shrunk in size and placed atop a plinth object. Using the visual
iconography of museums, I intended to highlight the sphere as a noteworthy artefact. Following this I decided to repeat three other points of interest in a similar fashion, which I hoped would suggest their presence as hidden, discoverable objects.

![Figure 73: Screenshot, WORLD4.](image)

Plinths containing point-of-interest objects; note the similar red sphere objects visible in Figure 71. Dotted lines added for clarity.

Following the plinth objects, I added the red sphere to two other locations with their own animations. A smaller red sphere moves through a corridor, another larger red sphere bobs within a white-and-black void; the object was used 4 times in total, all derived from the more original large red sphere.

During week 8 of WORLD4’s development, out of my own curiosity I decided to expand on this element of repetition further, for an intentionally disorientating effect. I repeated the entire starting room location and the multi-cube landmark object, placing these duplicates in another game-world location. I intended for this to be a discoverable, inverted version of the starting environment, to disrupt clear spatial readings of the
level layout by manipulating symbolic associations I assumed players would have, having explored the non-inverted original starting location.

I hoped this would lead to players questioning their movement steps, although I was unsure if the disorientating effect would discourage exploration. In light of this uncertainty I made slight changes to these two repeating elements, modifying their colour and surrounding layout and arrival so observant players could intuit a difference between the two.

Location-Based Audio

When creating both Evocative Districts and Points of Interest I considered location-specific audio as a powerful tool, based Chapter 3 analysis. I first considered two uses of audio: 1) audio as a navigation tool, to guide player orientation through two-channel audio; 2) to contribute towards a location’s sense of atmosphere and place. Totten describes the game’s “soundscape” (Totten 2014, p.369) as an important aesthetic communication tool, and an integral part of how mood and atmosphere may be conveyed to the player.

While I considered audio as important, in-depth use was outside the development and research scope. I decided to incorporate a basic use of sound with these two factors in mind, in creating a simple ‘sonic environment’ to support the explorable game world in providing emotional and practical cues.

To guide my audio selection and implementation I selected a three ambient electronic music tracks from artists I was familiar with and played each in the background while exploring the prototype game world. I found these audio tracks provided a sufficiently rich ambience in creating both atmosphere and mood. These influenced my creation of a basic ambient soundscape, used throughout WORLD4, corresponding to different
environment locations and activated through invisible volume triggers on player collision.

*WORLD4*’s soundscape was created through a combination of licence-free audio recordings including mechanical noises (idling engines, fluorescent light humming), bodily noises, and digitised audio created in free software *BFXR*. Separate audio files were merged and modified in free editing software *Audacity* (e.g. stretched or compacted, echoed and reverbed) to create an effect I felt reflected the personality of a location, or to denote a characteristic (e.g. a sense of scale), or a transitory change in environment such as passing into another district. My audio aimed to create a mysterious and uncanny, or at times unsettling atmosphere, and elicit a feeling of the unknown.

I created ambient, background audio to be activated and change depending on a player’s position in the game space, corresponding with locations and a crossing of visible district thresholds (e.g. an edge or opening). My first experiment was in the starting area location, giving the stark grey room a low droning tone, followed by different sounds in surrounding locations. Ambient audio would shift as a player crossed into the mall atrium area, into slow, droning, and echoing music. I considered my implementation and use of location-specific ambient audio as more textural, in a similar way to how I had applied surface materials and colours.

While creating points of interest artefacts, and more specifically, landmarks, I decided to make use of audio to draw attention towards their position. My initial motivation was to draw attention towards the large red moving sphere in the atrium while it was out of sight. I gave the sphere a proximity-based sound, a loud, repetitive hum from the
object's position. As the sphere moves the sound travels with it and can be heard even if the object cannot be seen.

Through spatialised stereo audio, I intended to influence player orientation assuming players would seek out the source. With the large red sphere, I wanted to draw attention towards the vast vertical chasm and hoped it would enhance the moment of discovery. Between points of interest and locations I decided to re-use audio, both due to limitations in time finding appropriate sounds, and with interest in seeing if audio patterns could potentially yield a similar effect to *Repeating Symbols*.

### 4.4 Conclusion

In conclusion, I have adopted a practice-based, research-through-design approach, building upon walker design lessons to address the following question:

How can these design attributes be used to design first-person walker games and 3D games more broadly?

I have discussed how this transition was not one-dimensional but inspired by reflection on the results describe in Chapter 3, development-led and research-through-design methodologies. My motivation was to respond to and implement theoretical insights, in the interest of creating deeper and more generalisable knowledge applicable to the game design field.

To investigate my questions, I created *WORLD4*, a multidimensional first-person exploration game using four simultaneous first-person views. *WORLD4* utilised the four walker design themes and provisional recommendations found in Chapter 3 as a basis for its design. Ambiguity was specifically prioritised as a design focal point and potential experiential outcome. *WORLD4* was designed through a non-evaluative
iterative process consisting of multiple versions over 11 weeks, through technical experiments and informal playtests.

WORLD4's focus on interactions and spatiality and limited development resources revealed key differences to the walker games analysed in Chapter 3, and similarities to DIY indie walker games (see 4.2). Existing walker games were drawn upon for spatial and environmental design techniques, and other fields including architecture for inspiration. WORLD4 was identified as significantly different to existing walker games, by exaggerating the looking interaction and distorting the readability of the game world through fragmentation.

The design consisted of five key features, informed by Chapter 3 findings, theories and methods from the field of game design, and broader design research. These include: views; hidden objects; exploratory layouts; distinct moments of discovery; memorable iconography. I described the design process of each of these features and highlighted challenges and decisions made during their creation, and throughout the overall design process. My discussion may provide some insight for game designers when considering different approaches to utilising walker design traits.

To understand WORLD4 in-depth and exploratory experiences the design may yield, it will be further investigated as part of my research methodology. In Chapter 5 I describe a two-stage player study of WORLD4 to collect qualitative data for further analysis. As I discuss, my methodological approach changed to suit WORLD4's unique design and experiential traits. Through analysis of study results in Chapter 6, I reveal player experiences fostered by WORLD4, resulting in six prescriptive game design guidelines for the creation of ambiguity in explorable game environments.

Table 2 summarises the five design features of WORLD4:
Table 2. Consolidated findings, WORLD4 design features.

<table>
<thead>
<tr>
<th>Design Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Views</td>
<td>The design of the multiple ‘quad-view’ guided by the recommendation “direct player focus towards the audio-visual”. My intent was to enhance looking as a rich interaction, heighten focus towards the audio-visual game world, and to convey an explicit ambiguity of information onscreen. Iterations included a multi-display and mosaic view, informed by prior projects and research exploring information fragmentation, and informal play-test observations.</td>
</tr>
<tr>
<td>Hidden objects</td>
<td>The design of objects and game world elements concealed onscreen, primarily guided by the recommendation “fragmentation of information can provoke navigation”. My overall intent was to compel keen observation of the game world. Elements included: the design of object logic to determine their display within onscreen viewports highlighting or reducing their visibility; layered objects types to add further variability in how they may appear onscreen and in-world; a reduction of depth cues through surface blending to obfuscate and withhold the explorable space, so it must be moved around to be understood.</td>
</tr>
<tr>
<td>Exploratory layout</td>
<td>The design of the overall spatial level structure primarily guided by the recommendations “allow players to slow down and set their own pace” and “allow for moments of thinking and consideration of the world”. I intended to engage players in ongoing exploratory navigation and was inspired by a loose shopping mall theme and abstract geometric stylings. Major elements included: false walls and openings to withhold environment reveal, and a looping branching structure to increase chances of discovery. The level was redesigned through multiple small iterations for an ideal balance between navigation and spatial obfuscation, in response to informal play-test observations.</td>
</tr>
<tr>
<td>Distinct moments of discovery</td>
<td>The design of the level environment guided by the recommendations “aim for curiosity and provoking imagination” and “player exploration is an ongoing process of interpretation”. I aimed to design a stylistically rich and interesting environment to explore, through creating discoveries as their own source of interest. Elements included: specific stylistic choices in colour and material combinations for an “evocative” emotional effect; arrival and framing techniques to create moments of anticipation and reveal; blind corners and extended corridors to withhold discoveries and extend environment reveal.</td>
</tr>
<tr>
<td>Memorable iconography</td>
<td>The design of 3D object artefacts as significant, memorable points of interest in the game world, guided by the recommendation “player exploration is an ongoing process of interpretation” and themes of player focus and ambiguity. Artefact elements included specific stylistic choices to create iconographic visual and spatial traits, so</td>
</tr>
</tbody>
</table>
they may be easily identified and remembered. Objects were contextually applied as guiding architectural landmarks or concealed as rewarding discoveries. Audio was used to enhance their effect. Through repeating objects, I intended to use their iconographic traits for a symbolic effect, potentially conducive towards more interpretive readings.
Chapter 5: Player Studies

5.0 Overview

In Chapter 4, I discussed my walker-inspired game design, WORLD4. Through my design process discussed, I demonstrated how the four walker design themes identified in Chapter 3 could be used as a conceptual framework for game design. In this chapter I will conduct a player study of WORLD4 to understand its design in-depth and the played experience it yields. In doing so I seek to advance my investigation of the following question:

How can these design attributes be used to design first-person walker games and 3D games more broadly?

To do so, I have undertaken a two-stage qualitative player experience study, consisting of two alternative playtest approaches and data analysis discussed in 5.1 and 5.4. Through this approach I seek to highlight player responses pertinent to the five design features of WORLD4, and an experience of ambiguity and game world exploration.

In 5.1, I discuss Player Study 1, a qualitative player experience study. In 5.1.1, I discuss how I adapted grounded theory methods (LeCompte & Schensul 2010) for my playtest approach and conducted the study within a controlled environment. In 5.1.2, I discuss my data analysis approach using an open-coding process for thematic analysis (Charmaz 2006).

In 5.2, I discuss unexpected limitations and issues identified during Player Study 1 as methodological insights. I highlight issues in conducting the study within a controlled university environment and question the adaptation of methods. In response, I
propose undertaking an alternative qualitative approach better suited to studying WORLD4’s experience and my practice as an independent researcher and game designer working outside a lab environment.

In 5.3, I discuss and compare alternative methodological literature to address limitations and issues. In 5.3.1, I discuss remote game playtest approaches used by indie commercial game developers (de Jongh 2017; Daviau & Leacock 2017). In 5.3.2, I compare academic at-home “probe” (Gaver et al. 2004) methods. I highlight the appropriateness of adapting indie approaches to my specific research context.

In 5.4, I discuss Player Study 2, a remotely conducted qualitative player experience study. In 5.4.1, I discuss how I adapted an indie game developer play-test approach (de Jongh 2017; Daviau & Leacock 2017) for remote at-home playtesting. I discuss additional factors such as recruiting study participant players via Twitter. In 5.4.2, I incorporate datasets from Player Study 1 and Player Study 2 as part of my second thematic coding approach (Charmaz 2006) and acknowledge research limitations in this approach.

In 5.5, I reflect upon approaches for conducting player experience studies for game design research. I discuss methodological insights gained from Study 1 and Study 2 and highlight the specific demands, requirements and issues in conducting scholarly game design research. I present methodological considerations for independent game-design researchers seeking to adopt at-home and indie approaches.

Study results are discussed in the following chapter, Chapter 6: Design Findings. In 6.1, I discuss the three overarching themes identified that inform the six design strategies discussed in 6.2.
5.1 Player Study 1

Study 1 consists of an in-person qualitative approach to study the player experience of WORLD4. In Study 1, I utilised methods adapted from grounded theory research for an analysis of players WORLD4 game experience. Data acquired through this process was not to evaluate the success of WORLD4’s design or to inform design iterations, but to understand exploratory and ambiguous characteristics within its design, by analysing player behaviours through their in-game actions and verbal comments.

Methods chosen for Player Study 1 include recorded observations (LeCompte & Schensul 2010) of onscreen gameplay through screen-capture software, handwritten observational ‘in the moment’ notes and conversational interviews (Charmaz 2006 p.24). Conversational interviews began with open-ended questions during the playtest session as players play WORLD4, as prompts part of a ‘think-aloud’ format. Once the player’s gameplay session had ended, the interview continued with “ending questions” (Charmaz 2006 p.30), raised from on-the spot observations and notes recorded during the gameplay session (Lazar et al. 2010; Diane et al. 2010). Each session was recorded and fully transcribed following completion, for an open-coding data analysis adapted from Charmaz (2006, p.43).

By engaging in gathering multiple data points, I intended to provide a rich set of data that encompasses various facets of WORLD4’s design and game experience. My motivation was in response to analytical and data-capture challenges of WORLD4’s design features including the multi-viewport Views, and the reduction of depth-cues in Hidden Objects. Furthermore, by adopting multiple grounded theory methods, notably
conversational prompts, I could account for more elusive, ambiguous, and interpretive factors I had intended in WORLD4’s design, which may manifest during gameplay.

When selecting suitable methods for my approach I reviewed approaches within standardised industry practices for conducting game design research, including Isbister and Schaffer (2008) and Fullerton (2008). While reviewing these texts it became apparent they were not suitable to my research objectives but provided interesting contextual insights and basis for comparison.

Fullerton (2008) (revised from Fullerton, Swain, and Hoffman (2004)) present a general, formalised approach for conducting player studies. Knowledge presented shares an overlap with processes I had previously employed (including ‘self-testing’ during development in Chapter 4) and shares useful considerations for conducting observational within a games research context (e.g. recruitment of ideal participants). However, the applicability of methods discussed are limited; strictly directed towards an iterative design process as part of a formal, evaluative, data-gathering cycle.

Isbister and Schaffer (2008) also present a formalised approach to evaluative user testing, derived from HCI-related user research. However, their discussion provides useful methodological considerations within a games research context. The think-aloud process is described as ‘looking into the head’ of study participants by having them verbalise their experiences, and two game-specific models presented: concurrent (live) and retrospective (a think aloud of previously recorded gameplay) (Isbister and Schaffer 2008, p.66). The retrospective approach is considered ideal in interfering less in a player’s gameplay interactions, however concurrent is stated as ideal “when usability of the game interface is of primary concern” (Isbister and Schaffer 2008, p.66).
Although I am not testing the *usability* of *WORLD4* its multi-view design and overall ambiguous design intent, suggests the concurrent (live) approach as ideal, allowing players to vocally specify aspects of these elements *while* playing. Within this exploratory context a retrospective approach would be significantly flawed; a player who reviews their prior gameplay has significant retrospective insight gained through exploration, which may colour interoperation of their game experience and consequentially, any recorded data.

Another issue of consideration raised by Isbister and Schaffer are verbal prompts as a form of multi-tasking for participants, which may negatively impact their gameplay performance. These drawbacks are however more of a concern within certain types of reaction-based or cognitively demanding games (Isbister and Schaffer 2008, p.69).

In light of my intent to design *WORLD4* for reduced temporality and an exploratory gameplay context, I assumed this would be less of an issue. Furthermore, during informal testing discussed in Chapter 4, I observed players openly comment towards their game experience while navigating; an indication this method may not significantly interfere with the game experience.

In addition, Isbister and Schaffer (2008) make note of an alternative think aloud testing which relates to my chosen approach; “A less-intensive, alternative approach that researchers might consider is that not a formal think-aloud approach is adopted, but that any comments voiced by test participants are analysed (2008, p.71). Isbister and Schaffer recommend using multiple concurrent data-capture methods, such as observational behaviour recordings and conducting an interview “to ensure a richer “picture” of the issues around the game.” (Isbister and Schaffer 2008, p.71).
Both texts provided worthwhile testing insights e.g. the physical position of the researcher related to the player and game screen, and other environmental factors. However, despite a methodological overlap, Isbister and Schaffer (2008), like Fullerton (2008) specify an approach towards research as an evaluative method for iterative design refinement. Due this significant contextual difference in my research objective to study *WORLD4*, I decided against adopting these standardised game testing methods and chose to opt for more broadly applicable grounded theory methods previously discussed.

5.1.1 Study 1 Execution and Data Collection

As my first step in conducting the study, I recruited players as study participants locally at the RMIT University City campus. Recruitment was communicated through posters placed around the campus. There were no incentives to participate; instead, *WORLD4* was used as the major draw for participation in the study. The player call-out was an open invitation predominantly within the area of the RMIT undergraduate games degree, targeting the local demographic of students, male and female, ages 18 to 28.

One requirement was that players had to have basic experience in controlling digital games, so general difficulties playing could be minimised. The university focus was chosen to keep study logistics physically constrained, for easier scheduling for both participants and I, and for easier reach to a demographic interested in games. I had access to a secured office space on campus, which was chosen as an ideal environment for conducting the study in privacy. The study area was set up in an office room, on a PC and desktop monitor, with speakers and a mouse and keyboard that players could adjust to their preferred settings.
As I also teach at RMIT University, my existing student–teacher relationship was a factor taken into consideration. None of the students who volunteered for the playtest had been directly taught by me and, although my position as the researcher was assumed to influence how players approached the game, it was decided that there was no risk of professional conflict.

I recruited 7 players, 4 males and 3 females. All were RMIT University students or graduates. Study participants all expressed interest in playing WORLD4 as a major factor in volunteering. Study session times were estimated to take a total of 35 minutes: 20 minutes for WORLD4 gameplay; 15 minutes for follow-up semi-structured interview. However, session times varied more than predicted, ranging from 40 minutes to over 1 hour. Each session began with a statement of consent outlined for each player, who was told they could end the study at any time, as well as refuse questions or recording.

Onscreen play was recorded through screen-capture software Open Broadcasting Software, and player comments via microphone capture, allowing uninterrupted capture of the session. Handwritten and time-stamped observational notes were taken to highlight ‘in the moment’ observations. Before beginning WORLD4, players were encouraged to voice their thoughts via an open conversational method (Charmaz 2006, p.24), similar to Isbister & Schaffer’s proposed alternative-approach to think-alouds (2008, p.71). Players were asked prompts as they played to encourage ‘thinking aloud’ and help them voice their thoughts while playing (Appendix E shows a list of the prompts used).

I was concerned this approach would interrupt player concentration in-game; however, this was not the case. Players seamlessly responded to prompts while playing and
articulated their thoughts towards the game. A slower navigation pace was noted, as players stopped in-game to discuss environment elements perceived. As discussed in 5.2, my presence within the controlled study environment had unintended influence on how players played WORLD4. For example, players asked if I intended for them to perform certain actions during exploration activities. It is noted that my presence, to an extent, did influence players’ gameplay experience.

Once study participant players had decided to stop playing, a conversational interview began. Using Charmaz’s method (2006), interview questions expanded on observational notes taken during gameplay. Two types of questions were used: intermediate questions, focused on specific elements of the game design such as repeating objects and spatial tricks; and ending questions, focused on reflective responses such as why players felt a certain way towards game elements. A list of the questions used can be found in Appendix E. This was to raise deeper insight and detail as to player rationale and thoughts towards their game experience. During the study I noted that, as a designer acting as a researcher, I felt players were more inclined to express positive feedback and reflection; I expand upon in this in 5.2.

After the session had ended, I conducted a full transcription of the recorded video and audio. Each session recording was watched and transcribed in full, and new observations of the player’s in-game actions were noted. This included a transcription of the conversational interview. Full transcriptions were conducted in response to limitations in note-taking during the session. Doing so allowed me to pick up on observations and quotes missed during in-person sessions, and to construct a thorough data capture of each player’s game experience.
5.1.2 Study 1 Data Analysis

My observations of study participant play sessions focused on in-game spatial-exploratory behaviours, and comments towards the environment. In Study 1, transcription and note data was studied utilising an open-coding process to conduct a thematic analysis of each player’s recorded game experience. This was adapted from grounded theory methods (Charmaz 2006, p.42). Coding “means categorising segments of data with a short name that simultaneously summarises and accounts for each piece of data” and each code shows “how you select, separate, and sort data to begin an analytic account of them” (Charmaz 2006, p.43). The coding method provided an analysis framework for handling the large volume of transcription and note data accumulated (discussed further in 5.2). Through the coding process organised data can be more easily analysed in thematic analysis. Thematic analysis involves a higher-level interrogation of the coded data, which identifies shared relationships through note taking and discussions to highlight common or noteworthy themes.

The open-coding approach consisted of a two-stage process. In stage one, I focused on the transcription, observation and note data for each player. On a first pass of the recorded data, initial codes were noted, consisting of general terms that tagged and highlighted specific responses, comments, observations and quotes. On a second pass, the data was read again and initial codes were verified. Codes were given keywords that corresponded with recorded data (Charmaz 2006, p.50) such as disorientation with reduced depth, uncertainty towards animated objects, movement towards unseen audio. In stage one I generated 160 initial codes.

In stage two, initial codes were subjected to another coding pass, involved coding, to identify the “most significant and/or frequent earlier codes” (Charmaz 2006, p.57). For
each session, significant patterns in codes were identified as involved codes totalling at 50. With a set of involved codes for each session, I compared codes across all seven sessions and placed involved codes into code groupings categorised by likeness.

As curiosity was noted as the major experiential factor considered in WORLD4’s design, as discussed in Chapter 4, curiosity literature was drawn upon to understand whether an experience of curiosity manifested for players and, if so, what kind. For thematic analysis code groups were compared to the types of curiosity identified in models discussed in Chapter 3. These included those of To et al. (2016) and Tieben et al. (2011). Through note-taking and comparison, four initial common prospective themes were identified from the code groupings: 1) reduced perception; 2) exploration uncertainty; 3) mapping of the space; and 4) environmental interpretation. These initial themes would change following Study 2.

5.2 Insights and Limitations

After conducting Study 1, I reflected upon my investigative approach and results. The approach was worthwhile for understanding how WORLD4 could be investigated and revealed insights into the player experience. However, on reflection unexpected issues and limitations in my approach became more apparent.

Video and audio recordings were used to document each player’s game experience. Recordings allowed easy return to moments, comments or points noted, captured a necessary level of detail to understand player impressions, and highlighted aspects of WORLD4’s design. The volume of fully transcribed recording data was large, however. Totalling over 40,000 words, transcription and observation notes provided a very detailed and in-depth account of each player’s play session.
However, the transcription data was unwieldy as I found such a large volume of detail difficult to penetrate and thoroughly analyse. Software options were considered, but the size and volume of data presented issues for importing. The open-coding process worked when applied, and produced numerous insightful, analytically sensitive codes. However, due to their volume and time constraints, groupings were vague, as were themes, which I found too broad to condense and discuss concisely.

Full transcriptions were not a time-effective approach. I spent 21 to 35 hours total fully transcribing all seven sessions. The open-coding process and analysis of additional note sources added to this figure. This process was conducted over a week, a very short timeframe for adequate handling of the data. After completing the study, I realised I had spent too much time engaging with my accumulated data on a granular level. This intense focus led to a tunnel vision that narrowly framed my impressions of the data.

I felt that the in-person observations and controlled study environment were less than ideal for studying *WORLD4* as a game experience. The controlled testing environment (an isolated office within the University) and my presence as an observer, taking notes and prompting players to voice their thoughts, had framed the game experience as a very formal research experiment. Although much did not feel awkward or unnatural at the time, after studying the video data and on reflection I felt my presence and the controlled environment may have influenced player concentration, or at the very least led to social pressures that made players self-conscious about how they were playing and what they were saying. I questioned whether research participants had felt compelled to spend longer periods of time playing *WORLD4* and/or to express positive, non-critical comments, a socially acceptable and polite response to my presence, as the person who had made the game.
I also questioned whether both the prompts and interview questions were leading. For example, when asked ‘Could you describe what you are seeing?’ players tended to linger on the objects they described; I may have unwittingly signalled to players that an element was of some importance. Player would also ask me questions about aspects of WORLD4, despite my stating beforehand that I would not be able to answer game questions. These questions often concerned my intentions as a designer, for example whether I had deliberately placed openings so players would overlook and miss them, and whether the environment was randomised or changing over game playtime.

On reflection about Study 1, it became apparent that WORLD4’s game experience, like that of other walkers such as Dear Esther and Proteus, was a more solitary, meditative and reflective exploration experience. To me, the controlled environment and in-person observation were not entirely suitable for capturing the game experience.

Study 1 was valuable in providing granular insights into WORLD4’s player experience, notably in the codes produced and the granular data. I believe the unexpected issues and limitations do not invalidate the resulting data; however, I questioned whether results from an alternative study outside a controlled ‘lab’ environment would differ. I also questioned the applicability of strict adaptation of grounded theory methods as a time-effective approach for an independent researcher who is also making and studying games.

I decided to conduct a second study (see 5.4) to addresses these questions and add additional data to test and crystallise the results. To inform Study 2, I reviewed relevant alternative methods and approaches (see 5.3).
5.3 Methods Beyond Controlled Lab Research

In 5.2, the video and audio recordings used in Study 1 were identified as having provided worthwhile detail in capturing each player’s game experience and their thoughts towards aspects of *WORLD4*’s design.

In 4.2, I discussed informally playtesting *WORLD4* for design feedback while developing game prototypes, and how I placed an early prototype version online on game hosting service itch.io. The public download page had no promotion but was used to gauge public interest and impressions towards the multi-viewport design. To my surprise, the public reposting did receive a positive response and, notably, responses included videos; video bloggers documented ‘work in progress’ and prototype games, self-recording their gameplay and commentary. Examples include GMVR (2016) and Williams (2016) discussed in Chapter 4.

It is important to note that the video bloggers appeared to entertain or inform viewers, and likely provided a lower level of fidelity than average game-players. However, after reflection on Study 1, these videos showed methodological potential. Game and commentary recordings revealed a similar kind of game experience capture to Study 1 but without any instruction or provocation, and each video was self-recoded and posted. This revealed potential in adopting a remote approach as a useful method for documenting player experience within a more relaxed and natural environment, without logistical or in-person observation issues.

Inspired by these insights, I investigated alternative methodological approaches to better inform a remote testing approach for Study 2 (see 5.4).
5.3.1 At-Home Indie Game Developer Approaches

My investigation began with at-home remote playtesting methods used by commercial game developers. These approaches have emerged within smaller indie commercial game development teams, as an effective approach for capturing more natural gameplay experiences that is time and cost sensitive.

Daviau and Leacock (2017) describe testing the boardgame *Pandemic Legacy*, sending physical prototypes to players at their request to record pre-arranged at-home play-sessions. The recording data is described as surprising in “how relaxed people are in this environment, because people are in their own homes” (Daviau & Leacock 2017, t. 36:59), capturing naturalistic insights into how the game is being played.

Daviau and Leacock (2017) discuss this approach as a cost- and time-effective method for ‘testing above the table’ that avoids testing blind spots by seeking knowledge about the ‘experience itself’ rather than clinically examining the gameplay. Insights included how the physical components of the boardgame worked, how players read and used the rules, and instances of confusing design communication.

Analysing these recordings allowed Daviau and Leacock to “internalise and empathise” with player responses over extended play sessions. This was suitable for the game’s ‘legacy’ format, designed to be played over multiple sessions like episodes of a serialised television show. Within this context an in-person observational test is not feasible to conduct, as it would take days to observe and record.
Data analysis of the recordings was done through a spreadsheet, noting observations and comments by players for quick categorisation, readability and sharing between the designers. Part of this spreadsheet is shown in Figure 74.

De Jongh (2017) discusses at-home remote testing of the game *Hidden Folks*. De Jongh’s approach involves promoting a playtest via social media, sending a version of the game to testers remotely and having them record themselves playing at home. Captured video and audio commentary is sent back for analysis. This approach is informed by observations of other game developers, and their own experiences testing games in private and public environments. De Jongh argues that solo and small two to five-person team indie game developers often adopt unsuitable testing methods, such as those conventional to larger studios. Such methods include sample groups, data analytics and feedback surveys, which are resource intensive and unsuitable to constrained games and smaller teams. These methods produce what de Jongh
describes as “evil data”: data that is hard to interpret, conflicting, confusing and impedes the testing process.

De Jongh (2017) argues indie developers are better served by adopting a remote qualitative approach that is sensitive to appropriate settings for the game, and time and costs. Methods focus on testing in a comfortable and appropriate environment that does not negatively interfere with the players’ experience or them speaking their minds. de Jongh describes receiving counterproductive feedback when designing sliding doors in *Hidden Folks* (de Jongh 2017, t.03:30) and realising the testing environment, a loud and busy public event setting, was a counterproductive context for understanding the design problem.

Both Daviau and Leacock (2017) and de Jongh (2017) mention prior experience with analytics-driven, quantitative and controlled approaches as influencing their decision to use an alternative quantitative approach. Much of this is in response to the widespread adoption of quantitively focused and analytics-driven game-testing methods, used by larger studios in controlled testing environments such as those discussed by Zammitto (2015), and evaluative methodologies discussed by Isbister and Schaffer (2008) and Fullerton (2008).

Testers offer solutions that are rarely correct, an issue exacerbated by feedback forms and self-reporting, and analytics can mislead to solutions as they require preparation for problems that are not yet known (de Jongh 2017). Issues and benefits in using analytics data are discussed by Jongh (2017), highlighting “analysis paralysis” when handling analytics data; this data is effective for comparing elements and exposing some problems, but poor for highlighting the ‘real’ problem or providing solutions.
We can understand that, while analytics and qualitative approaches are valuable in different design contexts, such an approach requires critical thinking around the method for insights and design solutions. Daviau and Leacock (2017) and de Jongh (2017) argue that it is more helpful to observe and critically think through actual underlying problems so that insights may discovered, and appropriate solutions reached, something quantitative data cannot provide in their specific design context.

De Jongh (2017) and Daviau and Leacock (2017) note controlled approaches assume how the game will be played and miss environmental factors that naturally influence results. A remote approach allows a natural context, capturing a more comfortable and natural game-playing experience. By allowing players to play in their own environment and in their own time, testers can see whether players will take the initiative to play in the first place and how long they choose to play for without constructed conditions. In addition, such an approach reduces logistical, resource and time costs, an important factor for small studios or individual developers with limited available resources.

I find Daviau and Leacock’s (2017) and de Jongh’s (2017) methods inspiring. Both challenge notions of universally accepted method conventions, and stress specificity in adopting appropriate and suitable approaches for testing game experiences. As a solo researcher who works outside of a research lab and makes games independently, this approach speaks directly to my game-making and research practices, notably the limited time and logistical resources identified in Study 1 (see 5.2).

For Study 2 (5.4), I intended to adapt Daviau and Leacock’s (2017) and de Jongh’s (2017) methods; however, before proceeding we look at other at-home, domestic user testing methods used within design research. Looking at prior work helps highlight, by
comparison, the specific nature of my at-home playtest approach for studying players’ WORLD4 experience.

5.3.2 At-Home HCI Approaches

Comparatively, a number of human–computer interaction (HCI) design researchers have explored domestic, durational user testing with a variety of different methods. Methods include cultural probes (Gaver et al. 1999) and technology probes (Hutchinson et al. 2003). Probes are defined by Hutchinson et al. as “an instrument that is deployed to find out about the unknown” (Hutchinson et al. 2003, p.18), often placed in a study participant’s home over an extended period of time to gather data. Probes may include data-gathering materials and/or designed technology.

Cultural probes (Gaver et al. 1999) are a data-gathering technique used to inspire ideas in a design process by gathering data in order to understand users’ lives. Introduced in the Projected Realities research project (Gaver & Dunne 1999), the probe method introduced a package of mixed-media material interventions: postcards, maps, cameras, photo albums and media diaries, with open-ended, evocative provocations to elicit informative and inspirational responses from participants in order to record events, interactions and feelings. Once returned, probe data provides an impressionistic view of the participant’s thoughts and feelings of the design area, the “actualities for which we are designing” (Gaver et al. 2004, p.56).

The cultural probe approach is a response to what is considered to be more formal science and engineering-based approaches. Methods such as the use of “official looking questionnaires or formal meetings” are singled out as casting the researcher “in the role of doctors, diagnosing user problems and prescribing technological cures” or as “servants’ (Gaver et al. 1999, p.25). The perceived limitations of quantitative
approaches are argued to form a poor basis for a design investigation. As an ideologically opposed approach to quantitative methods, cultural probes seek to better consider user empathy and engagement, cultural implications and new spaces for design (Gaver et al. 2004).

We can draw similarities between cultural probes and de Jongh’s (2017) and Daviau and Leacock’s (2017) approaches. All express a similar aversion to quantitative data gathering as overlooking and clouding the player experience in informing design solutions. Daviau and Leacock, like Gaver et al. (1999), similarly specify that their approach seeks to internalise and empathise with player/user responses through contextual sensitivity. All argue methodological and contextual sensitivity may better inform reflective critical thinking towards design.

Technology probes (Hutchinson et al. 2003) present an alternative to the cultural probe method, adapting aspects of the method for a social science–oriented approach. Technology probes involve the deployment of ‘thought-provoking technologies’ in a domestic environment over an extended period of time. These technologies are functionally simple designs to encourage user interpretation and intended to provoke and encourage reinterpretation over the duration of their deployment. These technologies are in themselves the probe, containing analytics to autonomously collect data about their use. Once the probe is returned, the gathered data is used to inform further design experimentation that considers specific uses of the technology.

Hutchinson et al. (2003) argue technology probes differ to a typical HCI approach as participants are involved in the initial data-gathering process and inform the creation of designs that better address their needs and/or desires. Technology probes exhibit three interdisciplinary goals; “the social science goal of understanding the needs and
desires of users in a real-world setting, the engineering goal of field testing the technology, and the design goal of inspiring users and researchers to think about new technologies” (Hutchinson et al. 2003, p.17).

The technology probe method ideologically contrasts with cultural probes in their design-research context. In comparison, cultural probes leave design goals deliberately undefined to provoke imagination, and to formulate an empathetic and contextually sensitive understanding. Gaver et al. are critical of the appropriation of cultural probes for scientific research, arguing such use reveals “how the desire for control can dilute the particular appeal of the probes” and lose potential benefits and lessons (Gaver et al. 2004, p.65).

It can be argued technology probes deviate significantly from cultural probes, placing emphasis on the technological knowns and how technologies are engaged by participants within a domestic context. Despite differences between technology and cultural probes, we can identify shared commonalities with de Jongh’s (2017) and Daviau and Leacock’s (2017) at-home playtesting approaches. Like technology probes, their testing method seeks to gather contextually sensitive data for design iteration, rather than design conceptualisation as with cultural probes.

However, unlike both probe methods, neither playtesting approach seeks to focus investigation on the domestic context for design insight but, rather, incorporates the context as part of their playtest approach. While not focusing on environmental contexts, de Jongh’s (2017) and Daviau and Leacock’s (2017) approaches let the players themselves choose how they play, providing some insight beyond the screen in relation to how and when players play on their own terms. Both indie game testing and probe approaches share a distinct parallel; both are sensitive towards contextual
player/user factors as part of the methodological process and in understanding the design. Both respond to perceived limitations in controlled methods by seeking to involve contextual factors ‘beyond the screen’ as part of their methodology.

Although I am not directly concerned with ‘what is off the screen’, my approach in Study 2 relies on the things ‘around the screen’ just as much, to capture a more natural impression of the player’s WORLD4 experience.

5.4 Player Study 2

Study 2 consisted of a remote at-home qualitative approach to study the player experience of WORLD4. My goals in conducting Study 2 were to collect additional playtest data, in response to the findings and limitations identified during Study 1 (5.2). My approach in Study 2 was informed and inspired by the indie game developer methods discussed in 5.3, adopting a hybrid approach of indie data collection and recruitment techniques, with a more streamlined grounded theory methods.

Methods included those derived from Study 1: Written observations (LeCompte & Schensul 2010) of remotely recorded at-home gameplay (including on-screen game-capture video and audio commentary) (de Jongh 2017), followed by an open-ended questionnaire and survey for reflective thoughts towards the game experience (Charmaz 2006, p.36). Each at-home gameplay recording was partially transcribed once received.

I observed similarities in player game experience across all sessions. These included comparison of differences across viewports, memorization of recurring 3D objects, further investigation of environmental elements, overlooking or missing locations and objects, and returning to elements previously discovered
In data analysis, both Study 1 and Study 2 codes were utilised as part of the open-coding process for thematic analysis. Limitations in merging data sets were acknowledged and only use of Study 2 quotes was considered. I decided against a splitting of quotes due to their useful and influential insights found within those from Study 1, which were supported by quotes found in Study 2.

5.4.1 Study 2 Execution and Data Collection

My first step in conducting the study was recruiting study participant players remotely online (I did not have in-person contact with any participants). Recruitment was communicated online through the social media platform Twitter. This approach was intended to be a departure from recruiting and conducting the study locally on the University campus. The study participant player call-out was an open invitation not targeting a specific demographic and not restricted by gender or age. Player requirements included playing WORLD4 remotely and the ability to capture onscreen gameplay and microphone audio.

My recruitment approach was inspired by de Jongh’s (2017) approach: sharing and circulating work via social media using popular hashtags (e.g. #gamedev, #madewithunity) to recruit play testers. This approach used the Twitter platform’s broad international reach and revealed a very active and concentrated community of game creators and game-players interested in game creation.

Twitter was decided on as the method of recruitment as I had experience using the platform and an existing local and international following on the platform, 644 users at the time of recruitment. I could leverage these as a method for attracting a larger and more diverse number of potential players, although noting conflicts of interest and ethical research practices.
It is important to note much game-development work shared on Twitter is indistinguishable between commercial or non-commercial. For example, a game developer may tweet commercial project work and side projects using the same account profile and hashtags without a clear distinction. Within this context, the personal and promotional are often blurred.

Twitter is not the object of Study 2, nor are game developers or game-developer associated communities. However, it is important to note these factors to appropriately contextualise the recruitment approach and my personal biases in how I chose to use the platform. For example, my personal following was concentrated towards game-makers (professionals, hobbyists, students, researchers) as likely participants. Their commentary and feedback in Study 2 would likely be different to those of average players, and perhaps more considered or critical towards WORLD4’s design.

Recruitment involved a two-stage process: stage 1 – participant recruitment sign-up via Twitter; and stage 2 – study participation and follow-up.

Stage 1 recruitment took place over two weeks, communicated through call-out posts posted every two days to Twitter utilising popular hashtags (e.g. #gamedev), scheduled to target peak usage times in the following regions: Australia, the USA, the UK, Europe, as my user following was predominantly in these regions and this would provide stronger chances of receiving sympathetic retweets to broaden reach and coverage.

Posts involved a recruitment pitch strategy communicating WORLD4 as a work in progress and experimental game experience that might interest game-players, designers and researchers. I used animated GIF images of captured ‘movements’
from WORLD4 to provide an attractive glimpse of the game by highlighting moments and the four viewports as a powerful attention-grabbing gimmick (see Appendix F).

Twitter posts included different provocations directed at certain disciplines or interests, such as helping the design of WORLD4 or its gameplay as a unique and interesting experience. Text was succinct and URL shortening was used to fit within Twitter’s 140-character limit (since expanded to 280 characters). It is worth noting my Twitter following increased by 20 users, suggesting how tractional social media posting can generate interest (see Appendix F).

Posts referred to a Google Form sign-up page that contained supporting information such as the requirements, estimated study time (30 minutes to an hour), privacy and anonymity conditions. The sign-up form also contained a small optional survey for contextual background information; players were asked if they had experience playing walker games, had played or seen WORLD4 before or had experience using gameplay-capture software and were able to upload recorded video. Survey results (21–24 applicants had used such software) prompted me to create a tutorial video for assistance.

Within the two-week period, I had recruited 24 potential players. I had hoped to reach a higher number as the response rate was not guaranteed, identified by de Jongh (2017) as 30%, although as a well-known game developer de Jongh would likely receive a higher response rate. There was a noticeable fall-off between the first week (19 sign-ups) and the second week (5 sign-ups). The first post (see Figure 75) received the most traction in retweets. None of the 24 applicants were repeat study participants from Study 1 and none had played WORLD4 before.
The first recruitment post on Twitter (07.08.17); note the animated GIF image, URL shortening, and call-out text.

I contacted the 24 sign-up applicants via email, utilising a template as suggested by de Jongh (2017). Applicants were asked to respond to the test within a two-week timeframe and would receive a reminder email. All applicants were referred to another Google Form page that included step-by-step instructions for conducting the study: downloading and installing *WORLD4*; installing and running capture software (*OBS* 2017); playing *WORLD4*; and uploading recording options (e.g. a private Dropbox folder).

Estimated time requirements were given as an hour to perform all the steps outlined (broken down into estimated time per step), with no time limit or restriction on how long *WORLD4* should be played; “play for as long as you desire, quit at any time you choose”. I intended to help study participants better understand how to fit the study and gameplay experience into their schedule.
Players were asked to voice their thoughts while playing *WORLD4* and capturing their gameplay experience (see Appendix F). I derived this approach from the open-ended, conversational, “thinking aloud” prompts (Charmaz 2006, p.24) used in Study 1 (5.1.1). All players in Study 2 had no difficulty in voicing their thoughts while playing, suggesting that an initial prompt was enough to encourage commentary.

I included a short open-ended questionnaire and survey (Charmaz 2006, p.36) for after the gameplay. Although Daviau and Leacock (2017) and de Jongh (2017) discourage survey data, I wanted to try an alternative approach to the conversational interview used in Study 1 (5.1.1). These questions did not replace the recording data but sought to provide alternative insights – feedback about the testing process (ease and clarity), contextual participant information (their familiarity with walker games) – and to provide a space for reflection, thoughts and feedback regarding the overall game experience. A list of the questions used can be found in Appendix F.

I considered age and gender questions, but decided this information was an unnecessary requirement. As the study was remotely conducted online, I wanted participant anonymity to be a considered factor, and the gender information in Study 1 did not provide useful insights to understand player play experiences, and If necessary a follow-up survey form could be sent. Proper use of this data was beyond both the scope and focus of my research; I am not interested in this social science aspect, although I acknowledge I was making assumptions about participants’ overall game knowledge, age, gender and demographic, so I could constrain my research focus.

Of the 24 applicants recruited, I received 7 participant responses. This follow-through rate aligned with de Jongh’s prediction of 30% (2017). Of these, 5 participants found
the study process to be clear and 2 found it mixed due to recording issues with the capture software. Most participants responded within the allocated two-week window; however, the study extended over a month-long timeframe, prolonged by slower responses and video uploads.

After each recording had been received, I conducted a partial transcription of the recorded audio and video, which included written observations and notes (LeCompte & Schensul 2010). This approach was informed by Daviau and Leacock’s (2017) spreadsheet approach discussed in 5.3, which categorises and brackets observations and quotes for clearer data readings. Each piece of observation data is placed in categorical columns per player: Time (in video); Context (in-game actions observed); Comments (player comments transcribed); and Additional Notes (researcher thoughts). Doing so allowed for a faster recording, varying levels of detail, and clearer formatting of moments and comments observed.

5.4.2 Study 2 Data Analysis

In Study 2, transcription and note data was analysed utilising a similar open-coding process (Charmaz 2006, p.50) as used in Study 1, to conduct a thematic analysis of each player’s recorded game experience. The open-coding approach consisted of a similar two-stage process to that used in Study 1, discussed in 5.1.2; however, once this was complete, Study 1 involved codes were incorporated to formulate categorical themes.

I considered using only quotes from the second set of 7 players in Study 2, given how I observed my presence as a researcher during Study 1 may have potentially influenced players (discussed further in 5.5). In light of this limitation in the Study 1
data-set I reviewed of initial, noteworthy insights flagged in both sets of study data, and noted observed similarities in player game experience across all sessions.

Despite my presence in Study 1, I observed and noted player comments and in-game behaviours shared distinct similarities to those in Study 2, even though their environmental contexts differed. For example, in both studies players returned to previous locations and described their exploratory activities as ‘mapping’ the space and overlooked or missed of locations and objects. In both studies players were observed to characterize repeating objects collectively, for example, describing the red spheres as ‘ominous’, ‘creepy’, and as suggestive indicators for level design elements (e.g. vertical drops).

Study 1 quotes had already proved useful for their insights noted during observation, and consequentially had affected my analysis of Study 2 data. Similarities between data sets observed and noted, indicated further usefulness in Study 1 data within these examples. I decided discarding useful quotes would potentially diminish further analysis and discussion, such as articulating insights revealed during observation, note-taking, and transcriptions. Although I acknowledge the obvious problematic aspects, for these reasons I included both Study 1 and 2 data sets for data analysis.

When conducting data analysis, my focus was towards player actions, activities, and comments that highlighted exploratory in-game behaviours or environment characteristics. I looked for responses within the data pertinent to the five features of \textit{WORLD4} outlined in Chapter 4, and ambiguous and exploratory traits and experiences.

These included in-game behaviours such as exploration activities, and descriptive or interesting comments towards game world elements or their game experience, that I
felt best captured distinct aspects of a player’s WORLD4 experience. During the
coding process, these characteristics of the data were compared and scrutinized, to
ask if these were unique to WORLD4’s game experience and design traits, or a more
general game experience response.

For example, player behaviours noted included lateral movements around objects (to
view it from different sides), player circumnavigation of locations (to ‘map’ the
environment), collision with surfaces (to test for false walls). Examples of player
comments include vocal descriptions of their experience during these activities (e.g.
sensations of disorientation during circumnavigation, or a desire to ‘map’), and more
emotional and subjective expressions towards the game and world elements (e.g.
descriptions of a sensation of tension or wonder during navigation, or negative
readings of points of interest (e.g. ‘I don’t trust the red sphere’)).

I conducted a pass of each sessions recorded data individually, and identified general
keywords tagged to comments and observations. For example, ‘finding boundaries’
and ‘surface and object collision’ for player circumnavigation of rooms to locate
boundaries and openings.

A first pass of Study 2 recorded data identified 120 initial codes, consisting of general
terms that tagged comments and observations, and were verified on a second pass of
the data and given keywords. Initial codes were subject to an involved coding pass to
identify significant patterns. 40 involved codes were identified from the data. Involved
codes were compared across all seven player observations and were placed in
groupings categorised by likeness. The 50 involved codes identified from Study 1 were
then incorporated in Study 2, totalling 90 involved codes between combined data sets.
To scrutinize and compare relationships between codes, a whiteboard affinity mapping process was adopted to visualize the data. Codes were placed as sticky notes on a whiteboard, and gradually clustered by likeness to identify significant patterns and map affinities I felt were strong in correlation or distinct. Affinities highlighted reliable, shared traits between codes. For example, navigation wayfinding, interpretation of 3D objects, and investigation of locations were identified. More independent codes were clustered between groupings with shared likeness, and their relatability and divergences were discussed with supervisors.

Figure 76: Photograph, whiteboard mapping final stage.

Three dominant categorical groupings, Image Key – A: World mapping; B: Assigning meaning; C: Ongoing questioning. Smaller clusters within groupings, Image Key – 1: Observing inscrutability; 2: Overcoming disorientation; 3: Encountering misinformation; 4:
A more general thematic relationship was agreed upon across code groupings, forming seven dominant categorical code groups describing an overall player experience, shown in Figure 76: Observing inscrutability, overcoming disorientation, encountering misinformation, encountering novel elements, characterising novel elements, probing spatial boundaries, and questioning game knowability.

Literature discussed in Chapter 3, notably the types of curiosity identified by To et al. (2016), were drawn upon for comparison of these categorical groups, to understand the player experience of WORLD4 and to assist with the formation of shared themes. During this process, the four initial prospective themes identified in Study 1 (discussed in 5.1.2) were used as an additional point of comparison. Through further scrutinization and discussion with supervisors and colleagues of categorical codes, I identified three dominant categorical groupings of WORLD4: World mapping, assigning meaning, ongoing questioning (see Figure 76).

Following discussion, reflection, and data analysis of Study 1 and Study 2, I refined these groups for better specificity resulting in three overarching categorical themes that affected player experience. These themes contain the seven dominant categorical codes (see 6.1) of players’ WORLD4 experiences: 1) designing purposeful inscrutability; 2) shifting meaning; and 3) facilitating subversion of expectations. These three themes informed six prescriptive design strategies (see 6.2) for the creation of ambiguous exploration environments. An in-depth discussion of Study 1 and Study 2 results can be found in the following chapter, Chapter 6.
5.5 Reflection on Approach

After conducting Study 2, I reflected upon the methodological differences between Study 1 and Study 2. Based on these reflections, I have identified significant advantages and considerations in adopting at-home and remote indie game testing methods when conducting player experience studies. My reflection presents insights for solo researchers outside of a research lab, that may inform future adoption of these techniques when conducting scholarly game design research.

At-home and Controlled Settings

After observation of Study 1 and Study 2 recordings, I found Study 2 players tended to give more candid gameplay commentary and more critical comments towards their game experience. Although I observed players in Study 1 expressing negative comments at times while playing (e.g. when disorientated), none expressed any strong negative feelings towards the game experience. In comparison, Study 2 players expressed negative comments more often.

For example, Player 11 in Study 2 was observed to comment on their strong displeasure and frustration towards *WORLD4* on multiple occasions. Player 11:

> I really hated the colours. They were really uncanny colours. It felt like an intentional choice … As soon as I felt stuck or couldn't find new differences, I stopped being engaged and sort of rebelled against the elliptical language of the game. I'm not stupid, and if a game makes me feel like that, I won't play it any further.
Although Study 2 was remote, players were aware of my unseen presence as an observing researcher. Players were observed to direct their comments at me while playing, such as discussing personal anecdotes and experiences.

For example, Player 9:

This is going to be like a psychoanalysis session ... years ago I stupidly volunteered to be hypnotised ... and that feeling you get when you’re hypnotised is about losing your awareness of everything around you, and that disorientation is very similar to the disorientation I am feeling around here.

These contextual factors in Study 1 were considered in advance; Isbister and Schaffer (2008) argue this can be overcome through a ‘one way-mirror’ approach, physically removing the researcher. I argue rather than opt for expensive and potentially awkward testing-environment configurations further removed from real world gameplay contexts, Study 2 results reveal remote testing can minimise such issues.

Differences between Study 1 and Study 2 suggest remote distance from the researcher (and designer) in an at-home environment may reduce issues of tension and social pressure and may allow for candid or critical responses that might be insensitive or socially awkward in person. In addition, this perhaps suggests study participants, when given more responsibility and independence in conducting a study, feel less pressure or obligation to meet perceived researcher expectations.

Recorded gameplay lengths also varied between Study 1 and Study 2. The average length of play in Study 1 was 35 minutes with a range of 28 minutes. The average length in Study 2 was 25 minutes with a comparable range of 30 minutes. In total there was a 10-minute difference in playtime. Study 2 times (in minutes: 13, 15, 16, 19, 33,
reveal a greater difference in playtime lengths between the longest and shortest sessions compared to Study 1 times (in minutes: 22, 28, 32, 32, 38, 42, 50). I believe this difference is due to my presence and questioning prompts for commentary in Study 1. Players may have felt inclined to slow down and stop in order to properly respond. This also suggests that, without social pressure, players felt less obliged to play for longer durations as their interest or engagement with the experience fell.

Although survey data is discouraged in qualitative testing approaches (e.g. de Jongh 2017), follow-up questions and interviews were worthwhile for research purposes. Players did tend to make suggestions, but their interview and open-ended question responses provided contextual and reflective insights as to their overall game experience, discussed in Chapter 6, and feedback about the ease and difficulties (e.g. recording setup) in the testing process. More general impressions provided added a broader layer of insight to more granular data.

Despite contextual differences between Study 1 and Study 2, I observed similarities in player game experience, as revealed in Chapter 6; for example, all players’ reactions to the four viewports, observation of recurring objects (e.g. the travelling red spheres), investigation of uncertain environmental elements (e.g. the lack of visual depth) and missed elements (e.g. room openings).

We can understand that an in-person approach in an isolated room, while useful, could be considered unsuitable for WORLD4’s type of game experience: deliberately ambiguous, puzzling and exploratory. For example, as discussed in 5.2, players asked me questions about game elements and my design intentions. This kind of social discussion and back-and-forth towards the game is evidently suited to ambiguous and
puzzling game types, like walker games. In a quiet room environment, myself as the researcher took on the role of armchair observer involved in this social gameplay context, a participant in the player’s game experience. This kind of unexpected friction was reduced in Study 2.

Methods must be sensitively considered in relation to the game type and experience. Although all studies will have a bearing on the players’ game experience, an appropriate approach may reduce friction, unexpected outcomes and this kind of intense scrutiny on reflection.

Use of Social Media

Study 2 raises the question as to what we think of recruitment, such as what is suitable according to available resources like cost, time and space. The decision to leverage online resources and tools proved to be beneficial, as video and audio recording for data collection was largely without problem and provided a similar level of detail in game experience capture as the Study 1 recordings.

Recruitment via Twitter adds another dimension to how a researcher or research lab may recruit. Existing methods include using mailing lists, social media pages, public signups and leveraging their name or place within a university or institute such as a research lab, and a researcher without these resources may have limited reach within their university. Remote recruitment and testing can reduce the organisational logistics and operational logistics for conducting a study, such as finding an appropriate location and conducting the study in person.

Twitter provides an opportunity to utilise a freely available resource for recruitment and the use of appropriate hashtags can increase communication reach. However, successful recruiting via Twitter also depends on having a following cultivated prior; a
larger following and ‘reach’ will give posts a higher chance of response. An existing social network is required to make the recruitment and study possible, which may include colleagues or friends with large followings who will circulate recruitment call-outs to a larger audience. Targeting additional social media platforms or forums may boost the call-out further.

Recruitment via Twitter also presents additional issues. Frequent posting may increase the reach and create traction and momentum for circulating the call-out. This method is similar to those used in indie game marketing, as discussed by commercial game marketing professionals such as Clinnick (2017). Frequency requires content preparation and specific knowledge of social media communities, such as which hashtags to target and how to style posts for broad appeal. In addition, recruitment and data acquisition forms add another logistical layer in time required, which perhaps suggests this type of recruitment is unsuitable to those not active on social media.

Promoting the study for recruitment put me in the position of a salesperson opening my research up to a broader audience. In doing so I made use of a personal brand, as recruitment call-outs coincided with my posting interest (games development). This idea of a personal brand woven into social media communications is discussed by marketers such as Clinnick (2017) and is exhibited by developers such as de Jongh (2017). My position within Study 2 was not a neutral one; this is not a one-dimensional method for soliciting feedback, like traditional testing methods (e.g. Zammitto 2015); rather, it is used for multiple purposes, for example promoting WORLD4 game or increasing my Twitter following (see 5.4).

I argue that these factors are not entirely dissimilar to more traditional research approaches that utilise mailing lists or local networks for recruitment and controlled or
in-home environments to conduct the study. As discussed in 5.3, there is no ideal objectivity and the pursuit of such is misleading. A study will always be affected and influenced by contextual factors and cannot escape the fact that it is for research purposes. Influences will differ between approaches and maintaining an awareness of these factors is key, depending on research objectives and goals.

Using social media, specifically Twitter, also comes at a risk. Decentralised harassment campaigns targeting women such as Gamergate (see Golding & Deventer 2016), highlight the dangers and risks within the field of games when using online social media platforms like Twitter. A lack of moderation and policing increases the threat of targeted harassment and presents a very real personal risk. As such, I do not wish to glamorise or romanticise these platforms. For those seeking to engage with this method, I ask that these dangers and risks are properly considered as part of their preparation, before undertaking the approach.

As game design researchers, if we are to engage with game development practice, it is important to engage with emerging and current contexts and approaches. I argue there is a risk when adopting evaluative methodologies in consideration their approaches as producing ‘clinical’ or ‘clean’ game experience data, ‘shielded’ from environmental factors. I argue these methodologies can mislead us into assuming their insights are clearer and more reproducible. These approaches are ultimately shielded and removed from the more intermingled and messier real-world game-making contexts that designers such as de Jongh (2017) engage in. If we are to provide meaningful insights for the game design field, it is important that we challenge convenient and comfortable research boundaries, and directly engage with relevant game design approaches and contexts.
5.6 Conclusion

In conclusion, this chapter furthers an investigation into walker design traits, through an in-depth investigation of WORLD4’s player experience, undertaken to address the following question:

How can these design attributes be used to design first-person walker games and 3D games more broadly?

My approach consisted of a two-stage qualitative player-experience study involving 14 study participant players. The study consisted of two alternative playtest approaches and adapted observational grounded theory methods (LeCompte & Schensul 2010). Although the sample number of playtest participants is limited, data capture and analysis methods were chosen for a deeper and richer analysis of observational data, to yield worthwhile design insights.

Study 1 (see 5.1) included an observation of 7 players within a controlled environment, a conversational interview and full transcriptions of gameplay capture. Data was analysed through an open-coding process (Charmaz 2006), resulting in four initial prospective themes. Difficulties in Study 1 were highlighted and revealed unexpected methodological limitations and insights (see 5.2).

In response to these insights and public recordings (see 4.2), alternative methodological literature on at-home player studies was sought, including commercial indie game developer playtest approaches (de Jongh 2017; Daviau & Leacock 2017). Through a comparison of methods (see 5.3), I have highlighted the contextual appropriateness of the approach for solo game design researchers working outside of a research lab environment.
Study 2 (see 5.4) included an observation of 7 players’ remote at-home recordings of their experiences, an open-ended survey and partial transcriptions of gameplay capture. Study 2 data was analysed through an open-coding process and Study 1 code data was incorporated for thematic analysis. This resulted in three categorical themes (see 6.1) of players’ \textit{WORLD4} experience.

Following data analysis, in 5.5 I reflect upon the two-stage qualitative study approach, resulting in methodological findings. Findings highlight insights for game design researchers, notably those working independently. I present a methodology for game design researchers that adopts remote testing approaches from indie game developers for scholarly research.

Insights include considerations in data collection and study environments per game experience type, recruiting study participants remotely via Twitter, and difficulties and advantages in adopting current indie game developer approaches for scholarly research. I argue that game design is a difficult, complex and intermingled field of research, and these complexities may be embraced for insight through methodological innovations that engage in current game-making contexts.

In the next chapter, I discuss the Chapter 5 study results, including the three player experience themes derived from seven category codes, and six resulting perspective design strategies for the design of spatially-focused ambiguity in exploration games.
Chapter 6: Design Strategies

6.0 Overview

This chapter is a more detailed account of a published research paper (Muscat & Duckworth 2018) viewable in Appendix C. Parts of this chapter expand on themes and conclusions discussed.

In Chapter 5, I described a two-stage qualitative playtest study with 14 total study participant players, to investigate the played experience of my design project WORLD4. Observational data, interviews and questionnaires were analysed, and results synthesised through conducting an open-coding and thematic analysis process. In doing so I identified 90 involved codes and 7 dominant category codes.

In this chapter, I discuss results from this study, draw upon previous insights from game design, ambiguity, and curiosity theories discussed in Chapters 2, 3 and 4, to address the following question:

How can these design attributes be used to design first-person walker games and 3D games more broadly?

In 6.1, I discuss the 7 dominant category codes derived from player studies, organised in to 3 overarching themes. Each theme highlights specific aspects of players observed WORLD4 experience, through descriptions noted during the recording and analysis of collected data. These descriptions include observed anecdotes and quotes from players, which articulate and highlight their gameplay experience.

In 6.2 I use thematic insights as a basis for a basis for six prescriptive game design strategies for designing spatially ambiguous spatial-exploration games. These include: 1) multiple sets of incomplete information; 2) removal of feedback; 3) spatial tricks; 4)
use of misinformation; 5) designing for spectacle; and 6) breaking game patterns. As these strategies are primarily derived from *WORLD4* and walker game findings, my contribution has a specific first-person, spatial-exploratory focus.

I acknowledge these strategies cannot encapsulate numerous contextual complexities in a design, however, to strengthen their contribution and extend my design discussion more broadly, I draw upon design examples from existing exploratory games. These examples provide further insight towards how each guideline may be considered in different game design contexts, and potential applications and effects of designed ambiguity within games. In 6.3, I conclude with a summary of results.

It is my intent for these findings to not only contribute useful knowledge for game designers, but to further an understanding of ambiguity within the broader game design field. My Chapter 6 discussion overall seeks to expand our design vocabulary within games, by advancing how we may consider emerging game experiences, contexts and design approaches. It is my hope that future game scholars and designers may expand upon findings through other design lenses and approaches, and advance understandings that fall outside of major design discussions.

**6.1 Themes from *WORLD4* Experience**

Overall, while conducting playtest analysis players were observed to be engaged in playing *WORLD4*, which was frequently described as a novel exploratory experience. For example, Player 11 commented that *WORLD4* “feels like a puzzle to be explored, not solved”. I will discuss the results of the study and observed player experience discussed in Chapter 5, by articulating three overarching themes: 1) Designing Purposeful Inscrutability; 2) Shifting Meaning; and 3) Facilitating Subversion of Expectations. Themes are comprised of the seven category codes affecting players’
WORLD4 exploration experience. I describe each theme supported by example quotes given by players during and after their playtest session, as representative of their game experience. To articulate results I draw upon ambiguity, curiosity, and game design literature previously discussed.

6.1.1 Theme 1: Designing Purposeful Inscrutability

This theme describes how players found WORLD4 to be inscrutable during gameplay exploration. Inscrutability can be defined as an inability to be scrutinised, difficulty in understanding and interpreting, and being mysterious. All 14 study players commented on WORLD4 as difficult to understand, interpret, unfamiliar and mysterious, suggesting the game experience is an inscrutable one. Inscrutability emerged as a major experiential factor in three category codes in designing for: 1) partial inscrutability; 2) variable disorientation; and 3) inscrutability as misinformation.

Designing for Partial Inscrutability

Of the 14 total players, 13 expressed an interest and engagement in negotiating and resolving the unclear nature of WORLD4’s environment. Much of this was through their interaction with partially inscrutable elements. Player 13 described this engagement as “curious about understanding how I could move around”. Player 7 described enjoyment in trying to rationalise the environment; “I quite like the element of having to figure out what it is”. Much of this was through their interaction with partially inscrutable elements; elements that raise a question as to how they might be approached and negotiated to reveal the extent of their characteristics.

Partially inscrutable elements observed included the four-viewpoint onscreen interface (as discussed in Chapter 4.3.1), and game level techniques including false walls and concealed unlit forms. These are initially unclear and cannot be scrutinised at first;
hence I use the term ‘partially inscrutable’. These were observed to compel players to adjust in-game actions to understand and resolve unclear and unusual visual and spatial characteristics, due to their initially unclear nature.

For example, Player 7 stated while examining a visually elusive corridor and drop: “The walls here, it doesn’t actually look like up closely, but from a distance it looks like walls. Up close it looks like a drop, something I hadn’t quite realised at first”. Player 7 expressed uncertainty towards the unusual appearance of level geometry and was drawn in to confirm their initial impression of it as a wall. Player 7 was observed to adjust their movements and view to do so. They moved closely along the walls of the corridor, tracing its contours to discover an ‘edge’ at the drop, revealing the vertical shaft. On first impression the affordances of this element were unclear, giving an impression of inscrutability. However, an understanding was reached through more
‘investigative’ actions which revealed the true nature of its visual and spatial characteristics.

All 14 players performed similar movement changes in response to inscrutable elements e.g. moving closely along wall edges, tracing the contours of the environmental geometry, lateral movements to circle an object and view it from all sides, and physical collisions with object surfaces. These often concerned the following objects and rooms: the pink cylinder, red spheres, the depthless white room, sphere room, and multiple false walls; elements which utilise characteristics such as the manipulation of depth (see 4.3.4) and visual occlusion (see 4.3.2). Such elements often prompted players to shift their viewing angle to expose their 3D properties.

For example:

Player 8: “What happens if I walk into it [the pink cylinder]? Is this going to crush me?”.
Player 8 circled an animated pink cylindrical object and collided with its surfaces to test its properties.

Player 5: “I’m clearly in a tunnel because there’s an edge, so I can’t go any further… It feels like the same space because there’s those neutral colours, the same pink and blue… and it’s a void, there’s no space I can go. I can continue forward, I guess”.
Player 5 questioned whether they could and were supposed to move into a void space because of its lack of reference points and navigation indicators.
Player 3 described their actions when encountering the travelling small red sphere object: “I was curious to see what would happen, if it would send me back to the black room or the game would end, if there was an ending”. Player 3 notes these activities as investigating “what works and what doesn’t, not necessarily breaks, but what are my boundaries”.

The results suggests partial inscrutability supports navigation and guidance by drawing attention towards itself, paradoxically, by conveying explicitly unclear information that can only be understood once adjusted to. Partial inscrutability when initially viewed communicates an explicit information gap by obfuscating visual and spatial dimensions of the game environment.

Partially inscrutable elements share similarities with an ambiguity of information that suggests hidden information in the game environment, discussed in 3.2.4. Costikyan notes that within a context of uncertainty hidden information may “foster a desire for exploration” when players are aware of its presence within a game (Costikyan 2013,
Costikyan’s definition of hidden information closely relates to incomplete information, defined by Gaver et al. as information that asks us to “project our expectations into an interpretation of incomplete information” (Gaver et al. 2003). In addition, the design of partial inscrutability can be related to Gaver et al.’s tactic for enhancing ambiguity of information “use imprecise representations to emphasise uncertainty” (Gaver et al. 2003, p.238), as environmental information is spatially and visually blurred.

We may understand inscrutable elements in WORLD4 present ambiguity of information through concealing their spatial properties. These initially are perceptually elusive and present incomplete information. Partial inscrutability suggests that elements may be understood by exposing their environmental traits, revealing hidden information and reducing ambiguity initially conveyed.

In addition, player responses reveal a type of perceptual curiosity as emerging in response to inscrutable elements. Perceptual curiosity is defined by To et al. as attention given to novel stimuli cued through gaps in perceptual information (To et al. 2016, p.5). Players were drawn towards their novel appearance, notably elusive visual and spatial characteristics, and sought to understand their 3D form through investigation. Additional factors such as a lack of explicit audio-visual feedback assisting player navigation actions and interpretation, supported this information gap.

Player actions such as searching, investigating, touching and comparing 3D elements to probe and negotiate their unclear nature (e.g. whether an object was 3D or physically solid), suggests a type of adjustive-reactive curiosity; defined by To et al. as the connection of expectations to the specifics of a given situation (To et al. 2016, p.8). Players interacted with inscrutable elements to verify expectations and resolve
the ambiguous perceptual information gap presented. Player actions suggest that partially inscrutable elements foster a kind of solver’s uncertainty, discussed in 3.2 in ambiguity of context. Costikyan defines solver’s uncertainty as the kind of uncertainty caused by problems such as puzzles which challenge comprehension (Costikyan 2013, p.25). Partially inscrutable elements support solver’s uncertainty as players work to reveal the hidden information and expose their spatial properties, to reveal and resolve initial ambiguity.

Costikyan argues solver’s uncertainty may break the gameplay flow state, described by Salen and Zimmerman as “a challenging activity, clear goals and feedback”, and “having control in an uncertain situation” (Salen & Zimmerman 2004, p.338). Costikyan notes that a breaking of flow can be desirable in creating questions and uncertainty by jarring the ease of gameplay (Costikyan 2013, p.26). Player comments and actions observed reveal that gameplay navigation flow was frequently interrupted due to inscrutability within the environment.

It is important to note that partial inscrutability was also prominent in the use of multiple fragmented views. As discussed in Chapter 4.3.1, each view concealed information differently, so no single view should be focused on. Players commented on having to adjust to moving their vision between each view to navigate in WORLD4. Comparison across screens supports a lesser type of adjustable-reactive curiosity and solver’s uncertainty; views were negotiated as a challenge or problem to overcome to reveal the environment.

For 13 players the process of identifying and resolving partial inscrutability was appealing, and we observed a heightening of spatial awareness towards the game environment. It is important to consider the players as having been possibly more
willing to tolerate or negotiate potential frustration playing *WORLD4* within a research context. As the players were self-selected volunteers, we can understand that they might have approached the game experience in a more open-minded or speculative way.

Results suggest partial inscrutability concealed explicit visual and spatial information that may have guided or assisted navigation of the game space. In doing so players were compelled to investigate and shifted their movement actions to reveal the nature of its characteristics. In doing so, partial inscrutability supported alternative ways of perceiving the environment through heightening spatial awareness, specifically towards determining the extent of potential environmental inscrutability.

**Designing for Variable Disorientation**

All 14 players encountered elements that disorientated their navigation and visual perception of the environment. I observed that disorientation compelled both positive and negative effects expressed by players, depending on their interest and tolerance. This included removal of depth cues and application of onscreen visual noise. All on players expressed reactions towards disorientating elements that included “*confusing*”, “*unsettling*”, “*disturbing*” and “*disorientating*”.

Player 10 described their game experience as “certainly a disturbing experience to play through... there's some very strange noises and visuals going on, and it can be quite disorientating to work out where I am and what I'm doing... but as I've gotten used to some of it, as I've understood a bit better what is in various places, I've got bit better at finding my way around.”

Player 10’s disorientation may be linked environmental elements that caused discomfort (“a disturbing experience to play through”); however, despite disorientation
Player 10 noted that their ability to perceive and negotiate disorientation improved as they became used to navigating the game space over time. Reactions towards disorientating elements of all 14 players varied. For example, players described spatial disorientation when encountering a repeating room that was inverted in layout:

Player 14: "I have passed the threshold and I'm back where I started? No, it has the cubes, but it is not the same space, unless I can walk back through it? No, it'll go back where that hole I fell down. It's some manner or re-creation of the space."

Player 8: "Am I back at the start? Why am I back at the start? What have I done to cause this?"

Player 9: "This is another one-way door. Whoa, okay, I am back where I was before. No, this is some other place. That's the reference point at the top... I don't know which way I should be walking."

Figure 79: Screenshot, WORLD4.

Cone room viewed from a distance.
Another element includes the cone room, which features a dramatic increase in visual noise (multiple combined animations and lack of depth) and was described by Player 12 as: "oppressive and unsettling" and unintelligible when trying to negotiate the cone object within: “I lose all sense of orientation. I don't know where I am anymore.”

Player 9 described the cone room as "almost hellish, to be honest" and expressed confusion in distinguishing between repeating environmental elements around within the location: “I swear when I went into this room before the room on the bottom left [the hub] wasn't there. It was all pink. Maybe it was a bug or maybe the order in which I move through the rooms is conditioned.” Player 9 compared their WORLD4 experience to a past experience of disorientation: "there was something in the Adelaide Festival last year called Hall of Mirrors, I think it was shown at MONA in Tasmania, and this really reminds of that, where my sense of perception really feels lost … Years ago, I stupidly volunteered to be hypnotised, and that feeling you get when you’re hypnotised is about losing awareness of everything around you, and that disorientation is very similar to the disorientation I am feeling.”

However, both players 9 and 12 expressed interested in the sensation and negotiation of disorientation. For example, Player 12 commented that WORLD4 was “memorable because of how unsettling and unfamiliar it was!”. Player 9 described WORLD4 as “disorientating, not in a bad way though” and “I do feel a bit giddy, and I don't usually get motion sick, but I feel it a little bit, a bit disorientated from playing this.” Player 12 and Player 9 reveal a tolerance for disorientation and exhibited interest in understanding and negotiating this disorientation. Despite a loss of perception, the results suggest these disorientating elements and the experience of disorientation had an appeal as part of an overall 'unsettling and unfamiliar” (Player 9) experience.
Furthermore, Player 5 and Player 7 expressed surprise during navigation when realising they had overlooked a less prominent green room multiple times prior:

Player 5: “I just noticed that green room over here, I’m not sure how I missed that earlier… I might have just dissolved every single theory I had of this game”.

Player 7: “It was quite satisfying, it was in some sense a revelation, but at the same time it made me feel like I should trust my intuition a bit more.”

The appeal was not the same for all players. Player 11 expressed strong displeasure towards characteristics of WORLD4 that led to disorientation:

I really hated the colours. They were really uncanny colours. It felt like an intentional choice, along with the unpleasant noises, so that's not a prompt to change them (so long as that's your intention; to unsettle and disorient) … As soon as I felt stuck or couldn't find new difference, I stopped being engaged and sort of rebelled against the elliptical language of the game; I'm not stupid, and if a game makes me feel like that, I won't play it any further.
Inscrutability within \textit{WORLD4} had an unintended effect in disengaging Player 11, who rejected the experience. Player 11’s reaction suggests significant differences in the appeal and levels of tolerance towards inscrutability, presentation, and resulting disorientation. While this suggests a negative response in frustration in navigation and tolerance of such elements, 13 of 14 players were interested in negotiating disorientation. Our results suggest that despite negative responses, there is an appeal in being disoriented during exploratory navigation. Despite expressed frustration, players largely accepted disorientation as part of an overall unsettling and unfamiliar experience.

This appealing aspect of the game mirrors Caillois’ \textit{Ilinx}; games of disorientation that “momentarily destroy the stability of perception”, “provoke vertigo” and provide perceptual disturbances “commonly sought for their own sake” (Caillois 1961). Responses observed suggest a similar link between discomfort and appeal in disorientation in \textit{WORLD4}, through a desire to overcome or negotiate the effect, and investigate what was concealed or how the effect was achieved. The theme of disorientation relates to ambiguity of information, specifically in using “imprecise representations to emphasise uncertainty” (Gaver et al. 2003, p.238) with the effect of casting “doubt on sources to provoke independent assessment” (Gaver et al. 2003, p.239). Results suggest independent assessment involves player negotiation of the disorientating effect, depending on their tolerance and interest.

We may understand disorientation as disrupting the experience of adjustive-reactive curiosity (the verification of expectations; To et al. 2016, p.8) previously described. As players worked to verify their expectations, the chance of becoming disorientated increased. The information gap presented in the element may become increasingly difficult or unpleasant to resolve and may simply go unresolved. The appeal of this
experience varied between players in creating ‘good’ frustration that heightened environmental awareness, evident in their negotiation and expressed interest, but also ‘bad’ frustration as disorientation was simply intolerable and resolution was unclear (e.g. Player 11).

In much level design theory disorientation is rarely discussed. For example, game level designers consider disorientation as a perceptual disadvantage and leading to potential frustration, creating “a negative gameplay experience” (Totten 2014, p.187), and as only appropriate for scaring the player in “using negative emotions” (Kremers 2009, p.175). This experience of disorientation is articulated by Player 3: “It reminds me of the games I’ve played that try to play with that sense of anxiety, usually horror or something creepy like Bioshock, where you are completely on your own in a space.” Similarly, walker games discussed largely lack disorientation; clarity is prioritised to support comfortable navigation and focus (as discussed in 3.1.3). An exception is Dear Esther’s (2012) brief winding cave network, which uses narrow, occluded pathing to disorientate navigation flow. I observed this to have had a similar effect to what players described during moments of disorientation in WORLD4: being lost, unsettled and confused.

This aspect of WORLD4 challenges much level design wisdom, and furthermore, pushes back against much game design and game flow theory in not having “a challenging activity, clear goals and feedback, and having control in an uncertain situation” (Salen & Zimmerman 2004, p.338). This is evident in the partial inscrutability as discussed above; however, disorientation suggests a complete disruption of flow. Player comments such as Player 9’s description of a “hypnotic” experience indicate a loss of control. This kind of loss of control breaking navigation flow was expressed as enjoyable to Player 9 and others such as Player 12. Spatial disorientation at its most
disruptive may result in a positive kind of frustration that compels interest in negotiating and overcoming it. However, this may have an opposite, hostile effect, as revealed by Player 11’s rejection of WORLD4.

This strong negative player frustration expressed by Player 11 reveals limitations in the appeal of disorientation. I posit that these elements are far riskier in appealing to or alienating players, as their divisive frustration suggests. However, overall results suggest disorientation can be broadly appealing visual and spatial effects to be influenced by or overcome. For example, a total loss of depth effecting orientation was largely accepted by players as part of WORLD4’s appeal, and more broadly, as part of the perceptually elusive game experience and a strange environment to uncover and understand.

**Designing for Inscrutability as Misinformation**

Players were observed attempting to understand and resolve environmental elements that had no resolution. 8 of 14 players interacted with and commented on such elements. Player 12 described their WORLD4 experience as “intrigued and willing to decipher the world and understand how and why the four visions worked” but notes “maybe I failed to do that”. While playing, Player 9 stated “I'm sure there's something obvious I have missed” and “this game breeds a paranoia in the player, thinking about having overlooked something.” All players questioned their understanding of WORLD4, specifically knowledge of locations previously discovered. 8 players returned to prior locations to investigate further.

For example, Player 14 revisited a vertical shaft with the travelling small red sphere to assess if they could cross the gap: “I don't recall if there was anything else of interest
down here... I don't think there's a way I can cross the pit. I am going to follow the sphere and see if anything happens.”

Player 14 also revisited the red cone room (see Figure 79), recalling their previous actions and onscreen changes: "No, I think in the cone room I went in and stood on the cone and went left. I am hugging the wall here just in case there is something I didn't see earlier … Here I am walking forwards and back, but I hit this point here, where it gets cut off at the split screen, but my gut reaction was that something has changed.”

Player 9 revisited the starting location to compare differences other similar, duplicate locations (see 4.3.5): “I am going to re-tread my steps because something is not clicking on my end … We've been here before, how does that link up to where I was before? No, this is slightly different! I am going to go back to where I came so I can build a better mental map of what happened.”

Both players 14 and 9 remembered elements with inscrutable traits, which both returned to. We can posit that due to a lack of feedback in WORLD4 overall players expressed uncertainty if they had prerequisite information to understand these inscrutable traits or reveal hidden information within these elements. In doing so players questioned their prior encounters and understanding. Player 9, in one such example, explicitly returned to “re-tread” their steps improve their self-described “mental map” of the space as a method of comprehension.

In revisiting previously explored locations, 5 of 14 players revealed hidden and unintended glitches in the environment. Player 9 and Player 14 are two examples of players who revealed unintended glitches and anomalies in the environment, perceived to be openings, rooms or hidden elements.
Player 9 observed a glitch in WORLD4's *game world*, a dark blue seam within a corridor, and attempted to enter it: "Hey! It was dark blue, where did that dark blue go? I swear I am not seeing things, I saw dark blue before. That dark blue is not accessible? Maybe it is connected to this side of things. Bah! There must be another way around it. I don't know."

Player 14 also observed the same glitch and similarly attempted to enter it: "Wait! I thought I just saw a glimmer of something dark blue!? Right there. It doesn't appear I can go left into this blue space. It's visible right there, so I wonder if there's something in that direction."

This dark blue seam was a glitch, entirely unintended. It could not be negotiated or solved in any way. Due to a lack of exploratory and navigation feedback players expressed uncertainty that the glitch evidenced an undiscovered part of the environment, or a requirement of further insight to properly comprehend or access it.
Player 14: “I don't know if this little post here is relevant, probably not. I say relevant as if I have an indication of what I'm doing.”

Player 9: “I feel like I am stuck, which sucks because I think this is really cool. I think this is really cool! I am pretty confident in saying that, but I have got that disconnect, I cannot connect to the next thing.”

This suggests that the unintended glitch served as misinformation. Players perceived the glitch to be significant and expressed uncertainty as to how to understand or reveal it during investigation, much alike intentional inscrutable elements designed. Misinformation appeared indistinguishable to elements that could be understood or resolved, indicating a blurred distinction between those perceived as intentionally and unintentionally negotiable and ‘solvable’. A similar effect was noticed in other elements intended such as those discussed in Designing for Variable Disorientation.

4 players expressed enjoyment in not being able to resolve misinformation and fully understand WORLD4: Player 7: “Because of the way that I played it, I believe the whole experience was enjoyable because of its ambiguity, or it was at least mentally activating, trying to make connections.”

Of the 14 players, 10 expressed enjoyment in not being able to resolve the inscrutable characteristics of WORLD4. However not all players responded positively. In comparison, Player 11 found a lack of clear insight and feedback frustrating overall.

Player 11: “You've asked where I am going. I guess wherever the game is provoking me to go, part of that is trying to understand the rules. I feel like I am stuck now. I feel like I've done something wrong because I can't make anything change.”

Player 11’s frustration highlights a divergence in responses from players towards the same experience of uncertainty. Player 11 like other players was ‘stuck’ in resolving
perceived inscrutability within the explorable environment, which can be understood to be due to a lack of feedback. This difference in player response highlights that potential appeal and or negative frustration of players in resolving misinformation, without additional support, such as in-game feedback. 4 of 14 players noted that additional feedback would help resolve confusion during exploration:

Player 10: “Some sort of feedback on this front would have been appreciated”; Player 9: “It would be useful to have a subtle nudge as to whether or not an area was fully explored”. However, other players such as Player 8 expressed preferring withholding such information and insight: “to me, not having that knowledge was exciting”.

Misinformation fits with Gaver et al.’s definition of incomplete information in “inconsistencies to create a space of interpretation”, which have the effect of opening up a space of possible interpretations by opining up a space of possibilities (Gaver et al. 2003, p.238). As misinformation cannot be resolved it suggests the existence of hidden information that may surface and bring insight and disrupts solvers uncertainty (Costikyan 2013). We can understand that such misinformation forces interpretation, such as a comparison by players to other more intelligible elements within the environment. For example, Player 8 was observed to be motivated to explore misinformation and understand what it may contain and yield, although this did not emerge for all players.

According to To et al., misinformation can lead to an initial experience of adjustive-reactive curiosity (To et al. 2016, p.8) as players perceive an information gap and work to verify their expectations. However, as it cannot be resolved and is instead interpreted based on this lack of resolution, another type of curiosity manifests: curiosity about the complex or ambiguous, defined by To et al. as a preference for
observing or interacting with stimuli that are intricate, mysterious or contradictory (To et al. 2016, p.7). For example, Player 9 and Player 14 expressed perceived complexity in an (unintentional) inscrutable element, the blue seam, in response to its mysterious traits and inconclusive presentation.

We may conclude elements that convey misinformation conceal their nature to deceive players, and consequentially, raise question and uncertainty to the surrounding game world. Results suggest the impression of undiscoverable, hidden information conveyed by misinformation is desirable in communicating environmental ambiguity, and can yield significant exploratory appeal, for example, Player 9’s navigation to “connect the dots” to improve their “mental map”.

However, it is important to note potential disorientating effects to world navigation in fostering uncertainty towards the boundaries and navigation rules of the game world, as indicated by Player 11. I posit that misinformation reveals a tension within the design of a navigable game space and navigation feedback, in how clear and unambiguous or ambiguous an ideal explorable environment may be. Designers might consider the potential risks misinformation may have in effecting the reveal and intelligibility of the game world, specifically in finding an appropriate or ideal approach that does not discourage player motivation in exploring it.

Theme 1: Summary

In Theme 1 I observed how visually and spatially inscrutable elements onscreen and in-environment heightened players’ perceptual awareness. Players’ sought to negotiate and resolve such elements to understand their characteristics, sometimes yielding a disorientating effect. Players’ early gameplay exploration became perceptual events that were at once curious and compelling, and appeared to subvert
spatial and game understandings. Disorientation was observed to compel both positive concentration and interest towards the effect, or negative frustration depending on player interest and tolerance. Exploration activity overall appeared to be characterized by a sense of curiosity in resolving uncertainty. Players were observed attempting to understand and resolve environmental elements that had no solution and expressed uncertainty in doing so. Responses revealed a blurred distinction between elements perceived as intentionally and unintentionally negotiable, and a difference in preference between players towards such elements, and in having supporting insight.

6.1.2 Theme 2: Shifting Meaning

This theme describes observations of players’ comments that express spatial and narrative meaning derived from environmental elements, notably specific 3D objects. For example, Player 12 described WORLD4’s game environment as having: “a suspicious hint of a hidden meaning because of the unnatural aspect of the geometric shapes that seemed like ‘inhabitants’ of the place”. Observations highlight a contextual relationship between specific environmental elements and changes in player interpretation of the game world. This theme consists of two category codes: 1) awareness of context; and 2) combined context and shifting meaning.

Awareness of Context

Players were observed to express awareness of and interest in 3D objects and environment characteristics, often commenting and comparing their stylistic traits during moments of exploration. These moments were observed to be associated with bold, more memorable points of interest. For example, Player 10: “The larger areas with distinct pieces were memorable”. All 14 players were observed to be drawn
towards noteworthy points of interest, notably the large hub atrium, and expressed surprise and commented on the sense of scale and atmosphere:

Player 12: “It was memorable because of how unsettling and unfamiliar it was! One highlight was seeing the huge red sphere appear out of nowhere in the vertical corridor.”

Player 7: “The ominousness of the big red orbs was quite prominent, and the sound that came with it. I think the sound worked quite well with it and made it quite impactful ... That difference in colour, that pink-y-blue-y... It was endlessly upward and endlessly downward, it felt like you were a blip in this infinite universe, although it didn’t necessarily feel infinite.”

In addition, players commented towards specific expressive environmental elements from which they derived an impression, such as the use of ambient background audio, and location-based sound effects:

Player 8: “It seems like I am in a building as a body or something ... Maybe I am in some sort of living building. There’s a pulsating thing, an internal organ.”

Player 7: “I kind of got like a factory vibe from it, or maybe you’re inside a machine. Like that sound playing in the background, that kind of sounds like someone hammering something.”

Player comments reveal that the ‘infinite’ atrium space was evocative and memorable for players e.g. Player 10: “The larger areas with distinct pieces were memorable, as were the pieces of music that played in particular places.”

Another example includes player encounters with a distinct small travelling red sphere object (also referred to as a “sphere”, “ball” or “circle”). The small travelling red sphere
emits an alarm sound and animates, moving through a corridor over an obfuscated vertical shaft that players can fall in to. Because of its unusual characteristics all 14 players were observed to move towards and track the sphere object and express comments of uncertainty towards it. For example:

Player 8: “I really wanted to follow the ball even though it’s threatening.”

Player 10: “Is that circle still going away? It is. I get the feeling that is a bad thing, I don't know why. There appears to be an alarm associated with that ball but it has passed on, so I’m not going to worry about it anymore, I guess.”

Player 4: “I think the red dot is an evil character or something, but I don't understand. It seems menacing in a sense when you walk up to it. I walked up to it before and it made this growling noise, but I didn't understand why.”

Players were observed to be drawn towards environmental elements featuring novel stimuli such as movement, scale, and contrast. Of the 14 players, 10 moved near the object and followed it along its animation path. By doing so players often unwittingly fell into a shaft within the corridor, resetting their location.
Player 6: “I was trying to follow the red sphere, but I fell through the ground.”

Player 10: “Oh, what's that? Oh, okay, I am going to say I wasn't supposed to go there and was killed and sent back to the start.”

Player 3: “Let’s see where that goes. I don’t know! I don’t trust things that fly past your view. Ah! it made me fall in something.”

Following this encounter, the players were quick to characterise the small sphere as a threat.

Player 6: “Oh no, he’s back! He’s going to kill me! Nah, I’m not following you this time, because you led me to my death.”

Player 11: “Maybe the red ball is bad. I heard a noise. The red ball is definitely a serial killer in my head.”

In this moment, players applied negative meaning to the sphere because of its contextual association to its location, associated disorientation, and blocking of
exploration (reset back to starting location). Results suggest players applied arbitrary meanings and narratives to the environment and objects elements based on their prominent characteristics and contextual properties. For example, the notion of “a suspicious hint of a hidden meaning” noted by Player 12.

This suggests an ambiguity of context as discussed in 3.2.4, defined by Gaver et al. as things that may be “understood in different context, each suggest[ing] different meanings” (Gaver et al. 2003, p.236). This relates to Gaver et al.’s tactic of creating ambiguity of curiosity: “block expected functionality to comment on familiar products” (Gaver et al. 2003, p. 239), relating to the concealment of any explicit functionality disrupting a clear reading of it.

This also suggests an experience of perceptual curiosity as suggested by To et al. (2016, p.5). Players were drawn towards environmental elements featuring novel stimuli like the red spheres and atrium, and what their appearance and behaviour within their environmental context might entail, for example following the travelling small red sphere as a guiding object.

Meaning derived from ambiguous context is common in walkers (see 3.2.4); however, this is often within a narrative context, for example detailed environmental storytelling objects within evocative environmental narratives (Jenkins 2006) such as Gone Home’s (2013) hair-dye bottle discussed in Chapter 3. Within WORLD4 there was no intentional narrative focus, nor are 3D objects intricate, detailed or technically complex. Yet these elicited a response from players. I posit this ambiguity arose from environmental elements that could not be easily understood or unexplained but were evocative in presentation and placement. We can understand that players applied
meanings based on contextual associations as an overall strategy to make sense of the game and game world, so it may be understood and explored.

**Combined Context and Shifting Meaning**

Over time players became aware of the shared characteristics between repeating environmental elements, notably 3D objects. For example, the three animated red sphere objects discoverable in different locations, as discussed in Chapter 4. Each sphere has a similar red appearance, and more are found near vertical shafts in the environment. All 14 players who unwittingly fell down shafts associated their fall with the sphere. Each sphere shared a similar red appearance, and each was located near a vertical shaft or drop in the environment.

As players discovered each animated sphere, they noted similarities in appearance and context between each object. Spheres in different locations were negatively characterized; players were observed to describe the spheres as the same object because of their shared characteristics.

Player 9: "Am I going to fall down now that I have seen this red thing?"

Player 6: “That’s that evil red sphere that made me fall through the ground. Maybe that’s an evil sphere and I shouldn’t follow it.”

Player 8: “Oh my god, my friend the ball! It's probably not friendly either.”

Over time players became aware of the sphere object in different contexts throughout the environment. For example, players encountered a single non-animated decorative sphere that shared the same visual characteristics as the three animated spheres. This decorative sphere was placed atop a plinth, arranged in a column of plinths
featuring other objects (see Figure 73; 83), whose shared characteristics were noticed by players.

Player 6: “That's that evil red sphere that made me fall through the ground. Right. So, they have some significance, I'm just like, yeah, they're just museum props.”

Player 14: "Ah, do these four pillars represent the rooms? I was in the cone room, and there was a sphere. This pink cylinder seems to match this pink cylinder, so maybe there's a correlation there."

As players became increasingly aware of the different sphere objects and their shared characteristics, contextual meanings associated with those encountered changed over the duration of their exploration on repeat encounters.

Player 6: “It's not actually evil, but I just thought it was because I thought it was making me fall through the ground, but it wasn't, it was just the level. But he does make evil sounds, so he could be evil.”

Player 6 had described the red spheres as “evil” after their initial encounter with the small red sphere, which they followed and fell down a shaft. Over time, Player 6’s awareness of the sphere object changed and so did their interpretation of it as evil.

Similarly, Player 7 was observed to comment on a change in meaning derived from the spheres, expressing an awareness towards how they derived arbitrary meanings during their encounters.

Player 7: “Also the association, that I fell when I thought there was a platform beneath me, had a negative impact on [my perception of] the orb… I assumed that it was a negative object. But now I have made that perception, that the three are connected, which made me feel like that the orb isn't necessarily a bad thing.”
Player 7 described a similar experience in repeat encounters with the plinths objects (see Figure 73; 83) over the duration of exploration: “I thought they [the plinths and objects atop] were iconic shapes throughout the world. Objectives, the four rooms you have to find.”

![Figure 83: Screenshot, WORLD4. The plinth objects.](image)

Over time, Player 7 exposed context and revealed that the plinths did not contain all the “iconic shapes” discoverable in the environment: “They’re objectives and red herrings because there are things you can find that aren’t there as well.”

Player 14 was observed to use knowledge of the sphere objects to identify and avoid vertical drops when navigating the environment (see Figure 84).

Player 14: "Oh! Maybe the red sphere is coming down here because it is like that initial room that had the red sphere coming down here, the mall-looking room! ... I guess this might be hinting at the fact that there’s a hole in this floor, because there’s a red sphere emerging from the centre of this room like there was in that one. So, I am going around
the perceived hole, based on that assumption, and also the fact that I fell in the room before."

Player 14 used the knowledge of the shared characteristics between sphere objects to identify a consistent rule, a hole in one of the rooms they had not detected. With this knowledge Player 14 circumnavigated the room, avoiding the hole, revealing a spatial and navigational reading of the object’s combined context.

Not all players were compelled to interpret environmental elements; 8 of 14 players were observed to have derived meaning from repeating elements, which gradually changed with additional contextual insight. 4 players compared repeating elements and speculated on their interpretive narrative and spatial meanings beyond any design intent.

Player 7: “I was continually trying to figure out where they were and what their meaning was … I found out that the shapes had some sort of significance whenever I saw one”.

Figure 84: Screenshot, WORLD4.

The hidden hole in the floor, negotiated by Player 14.
In Chapter 3, the use of repeating environmental elements in *Dear Esther* (2012) was discussed as a method for fostering a combined interpretive narrative meaning, within the clearly patterned and linearly pathed game space. Meaning derived from these elements in *Dear Esther* (e.g. candlelit vigils, circuitry diagrams) is supported by other narrative devices such as the semi-randomised monologue. Such elements are cryptic and ambiguous as to their meaning but increase in frequency and repetition during navigation over the duration of the game experience. Such use of elements strongly implies an intended significance, influencing what meaning may be derived.

In comparison, in *WORLD4* I intended environmental points of interest to be basic geometrical shapes that were reusable and evocative, gesturing towards significance. As discussed in Chapter 4, these objects primarily served a simple dual purpose: spatial guidance (as reference points and landmarks) and distinctive decoration. Symbolic meaning of repeated, patterned objects was considered to suggest an ambiguity of relationship, inspired by *Dear Esther*, however, the degree in which players expressed interest in attributing meaning and types of interpretation derived by players was surprising.

Patterned elements in *WORLD4* suggest an ambiguity of relationship surfacing, similar to *Dear Esther*, although less narratively focused. Ambiguity of relationship is defined by Gaver et al. as arising “from the viewer's personal relationship with the piece” (Gaver et al. 2003, p.237). Players compared elements and speculated on their narrative and spatial meanings once their combined context was known. However, within the context of *WORLD4*, the likelihood of objects being missed, discovered and rediscovered increased significantly, effected by the game’s multiple viewport, visually occluded, and repeating level layout designs.
Despite differences, shifting interpretive readings observed suggest player interest in deriving a subjective ‘narrative of use’ through discovery of an implied relationship between 3D object artefacts, specifically those repeating, stylistically evocative, and contextually associated by players. This relates to Gaver et al.’s tactic for provoking ambiguity of relationship: “offer unaccustomed roles to encourage imagination” and “point out things without explaining why” (Gaver et al. 2003, p.239).

We can understand that two different kinds of curiosity experiences may emerge through this ambiguity of relationship. Curiosity about the complex and ambiguous is defined by To et al. as a preference for observing or interacting with stimuli that are intricate, mysterious and contradictory (To et al. 2016, p.7). Players were observed to express interest in shared traits and ambiguous properties, for example Player 14 identified the traits of the spheres and later used this knowledge to circumnavigate a room. Player 7 identified the plinths and associated objects as “objects and red herrings”. In addition, players sought to understand and resolve ambiguity by developing an exploratory mental model to explain their relationship; explicitly stated by Player 7: “I was continually trying to figure out where they were and what their meaning was” and Player 9: “I am going to go back to where I came so I can build a better mental map of what happened”.

Although these types of curiosity did not emerge among all players, in those observed both spatial and/or narrative meanings were expressed. This seems to concur with To et al.’s findings of conceptual curiosity, the “desire to find things out” and to create a mental model so that the game can be rationalised (To et al. 2016, p.7). This also relates to Cross’s description of meaning making in constructing and ‘deconstructing’ the character of the environment (Cross 2015), which shares parallels with traits of ambiguity discussed.
We can understand in *WORLD*4 the narrative of use in environmental artefacts derived by players was influenced by the distinct repeating, patterned traits of these artefacts and combined, shared context. As such, how players encountered artefacts, revealed their traits individually and collectively, most notably, as discoveries during exploration, was a major influence in how an initial interpretation was derived and consequentially framed future encounters with the pattern. I observed a type of curiosity to arise in some players, most notably those who sought out artefacts to derive interpretive meaning over time. I posit manipulation and alteration of artefact context may modify and shift meanings derived over time to foster this type of curiosity, that may be conducive towards closer investigation or mental mapping.

**Theme 2: Summary**

In summary, Theme 2: Shifting Meaning describes player comments that indicate an expression of spatial and narrative meaning derived from *WORLD*4’s exploratory game environment, often based on visual, audio, physical, and contextual characteristics of 3D distinct or novel object artefacts. Player exploration activity was observed to be characterized by a sense of curiosity in resolving uncertainty. To make sense of uncertainty, players applied arbitrary meanings to environmental artefacts as an overall strategy to make sense of the game world. Results suggest players were aware of repeating traits in or application of artefacts and identified patterns in their contextual use. Player comments indicate a shift in spatial and narrative meaning derived over extended, repeat encounters. An effect of narrative interpretation exhibited by 4 of 14 players exceeded my expectations. An ambiguity of relationship emerged as players attempted to construct a comprehensive understanding of artefacts, indicating meaning derived was largely defined by context.
6.1.3 Theme 3: Facilitating Subversion of Expectations

This theme describes a subversion of understandings of explorable 3D game space and genre. 7 of 14 players commented that spatial characteristics challenged their existing knowledge of game spaces. Players speculated if WORLD4 was a walker or puzzle game in genre. This theme consists of two category codes: 1) subversion of space; and 2) subversion of genre. Analysis suggests that WORLD4 subverted player expectations and that the walker can be considered a spatially-focused frame for subversion in game design.

**Subversion of Space**

As players explored WORLD4's environment, they frequently questioned the characteristics and nature of the game space. Players often expressed uncertainty towards the environment, including inscrutable elements and those of misinformation. Numerous examples have been discussed above, however we can specify this more clearly with the following examples.

Obfuscation of view – Player 9: "There's something else here [in the environment]. There's probably a skill, right, like picking up things that obfuscate your views?" … "I should be able to move around that object."

Difficulty in spatial orientation – Player 7: “I'm assuming how the floor fell away. I'm trying to make sense of it, even if it doesn't make logical sense."

Difficulty in discerning forms of 3D spatial layouts and objects – Player 10: "I can't figure this out. These corner bits here are the planes of this room. This is an opening here."
Comments suggest the spatial characteristics of WORLD4 challenged players’ spatial knowledge, notably expressions of uncertainty towards the visuals, layout and logic of the game world. As discussed in the previous sections, WORLD4 contains similarities and differences to common representations of space within 3D games, however, such comments indicate WORLD4 subverted players’ existing spatial knowledge.

For example, Player 5 compared their understanding of vertical drops in other games to WORLD4: “I guess it’s when I see a drop – it’s pre-programmed thinking from other games. You see a drop and you can’t jump or you can’t find any way to progress from that drop, so you immediately think I am going to fall down that way and it’s going to reset me.”

Player 9: “The experience in general was quite memorable. I found my spatial skills tested in a different kind of way.”

This suggest players found WORLD4 different to representations of space in other games. Elements including spatial and visual inscrutability and irregularities subverted players’ existing spatial knowledge. More broadly WORLD4 required a specific kind of ‘skill’ to ‘decipher’ the explorable game space. 6 of 14 players describe their own theories as to how the game space could be understood, for example, if it was algorithmically generated:

Player 6: “Okay, this definitely was not here before! Or I’m not just very observant. Maybe this is procedurally generating as you, like, unlock different paths?”.

Player 14 described accessible rooms and openings “opening up” during their ongoing exploration over time; however, there was no such game logic: “It was clear to me that there was the central ‘mall’ room with a number of options, and I assumed that I would be opening more over time, which proved to be true.”
Player 5 described the game world as having specific ‘logic’ traits per location: “It could be a world on its own. It’s an architectural maze that has a life of its own, where those same rules don’t play outside of it. So here you might have the coloured cues, but it is a box within a box within a box outside of the maze and you enter the maze and that no longer applies, it’s a world of its own.”

Despite uncertainties observed, 13 players expressed interest and enjoyment in negotiating and developing an understanding of the game space, despite a lack of clear resolution or end-point. Results suggest negotiation and exploration of spatial subversion as compelling in its own right. For example, when asked about their WORLD4 experience:

P12: “Overall I was intrigued and willing to decipher the world.”

Player 10: “Very engaged. I was very focused on working out where I was and what was going on.”

Player 13: “Interesting. I’m curious about where this could go. I really like the notion of exploring worlds that could only work digitally.”

This theme of subversion of space encompasses types of ambiguity previously identified in Designing Purposeful Inscrutability and Shifting Meaning. Spatial subversion describes the broader compositional use of such elements, that once combined may compel questioning as to the nature of the overall game world.

Player reactions to WORLD4’s spatial subversion reveals, to an extent, a type of solver’s uncertainty as outlined by Costikyan. Solver’s uncertainty is defined as the kind of uncertainty caused by problems such as puzzles which challenge comprehension (Costikyan 2013, p.25). For example, Player 5 described the space as “an architectural maze” with its own underlying logic, as a challenging problem to
be solved or, as Player 12 commented, something to “decipher”. In comparison to the existing 3D game knowledge expressed by players, WORLD4’s space was interpreted as a similar spatial puzzle and challenge to solve.

However, as revealed in Designing Purposeful Inscrutability, the game space was often not solved or resolved. The game space remained ambiguous because of the presence of misinformation and disorientating elements, and this type of uncertainty remained. For example, the ‘paranoia of having overlooked something’ described by Player 9. Spatial tricks in WORLD4 may have initially elicited solvers uncertainty as players work to ‘map’ and ‘resolve’ the subversion, further compounded by a lack of spatial progression feedback. Player surprise and ongoing investigative actions during exploration indicates a desire to understand the scope or nature of the game space. However, over time as it cannot be fully ‘solved’ this type of exploratory navigation to ‘game’ the map was subverted.

This type of spatial subversion which manifested shares similarities with Gaver et al.’s tactic for creating ambiguity of curiosity “block expected functionality to comment on familiar product outlined” (2003, p.239). Over time as players questioned their existing knowledge of game space in order to adjust to and interpret subversive elements.

To most players this type of spatial subversion was observed to be of interest, compelling a ‘deciphering’ and reinterpretation of their existing spatial knowledge. Overall the extent of player questioning, and speculation perhaps indicates interest and enjoyment for players in having their spatial knowledge challenged through subversion, and its potential in creating compelling exploration experiences.
Subversion of Genre

Players questioned the nature of WORLD4 with reference to game genres, suggesting an uncertainty in expectations towards the overall game experience.

Player 14 commented on the possibility of there being a “lose state”, an aspect identified as uncommon in walker games: "I know conventionally in most of these walking simulator games there’s not really a lose state. I assume I won’t get hurt if I fall into this abyss. [Player 14 falls.] Alright, I died."

Player 11 also commented on this same shaft, having fallen down unexpectedly: "Now I feel vaguely betrayed because I didn’t feel it was a thing where you could do wrong. It did a sound that I did wrong and punished me by sending me back to the beginning."

These comments reveal a violation of expectations in what both Player 14 and Player 11 considered a walker experience to be, specifically in the absence of failure or loss states such as being reset to a starting location. We can also assume that information in the public playtest call-out and survey questions had players expect WORLD4 was a walker or walker-inspired game.

As discussed in Chapter 4 I did not intend for this element to be a failure or loss state but, rather, one of three locations as part of looping the repeating the environment, directly inspired by a similar use of spatial repetition existing walkers such as The Stanley Parable (2012); returning player to their starting location at the end of a branching path. It can be assumed the abruptness of the teleportation effect and encounter in a vertical drop location (synonymous with failure in many games) is why it was considered a failure state by players.

During their exploration 7 of 14 players compared their WORLD4 experience to a puzzle game:
Player 4: “It’s like solving a puzzle in some ways, I guess. But I don’t know if that’s the same for everyone, though.”

Player 14: “I felt as though the entire space of the game was some interesting puzzle to solve, or at the very least an interesting space to explore. It was amusing to try to suss out how some of the visual tricks were implemented as well.”

Player 3 compared WORLD4 to first-person puzzle game Antichamber (2013): “[WORLD4 is similar to Antichamber in] the way of using your environment and looking for those different things, although in Antichamber you get clues which are pretty loose, whereas here, you don’t need the clues because if you spend long enough, like I was at the start, looking, I guess you can see them … It has some importance on different angles and moving around, trying to change your perspective to solve the puzzle.”

Furthermore, players commented towards repeating and branching layout of game space and points of interest as ‘objectives’ like the structure of a puzzle game:

Player 14: "I'm assuming that this is laid out in a puzzle way, that once I have done all the things that there is to do, there will be some sort of confirmation or congratulations."

Player 9: “I'm unsure as to what progress I made. My impression was that my goal was either to collect the shapes on the pedestals or get through the space.”

Player 5: “I like how, with different points of interest, there’s different ways and different puzzles how to find them. That goes back to how do I get out of this room, what’s the path I need to take, what are those cues? [WORLD4 is] a puzzle game in a way that it plays with the player’s mind and forces you to think in a different manner than what you would normally.”
Comments towards \textit{WORLD4}'s puzzle-like qualities indicate elements such as negotiable partial-inscrutability and familiar spatial-layout patterns created an impression of \textit{WORLD4} as a puzzle game, despite not having explicit logic problems. Noteworthy example includes players seeking clear resolution of inscrutable elements, and questioning if there was an 'end' to the game; if it could be reached and under what conditions.

However, although \textit{WORLD4} was described as a puzzle game, descriptions were inconsistent as not all elements could be ‘solved’. For example, Player 14’s and Player 9’s were observed to go back and forth in describing it as a puzzle game experience:

Player 9: "Am I in a puzzle that I’m meant to be solving? It looks pretty and stuff, but I can't connect that to where I am meant to go in this room. It seems like a pretty aesthetic to hang out in, not a solvable puzzle."

Player 14: “I found it interesting and somewhat fascinating since traversing the space was somewhat alien, due to the unlit rendering style and movement of simple geometries. I felt like there was some solution to be found since it seemed a bit puzzle-y, but that didn't seem to be the case.”

Towards the end of their playtest session Player 14 was observed to express uncertainty towards \textit{WORLD4} as categorically fitting the puzzle and walker genres, by distinguishing between both types:

Player 14: “I'm not sure how puzzle-y it is. If it is testing for things that are called walking simulators, in the pejorative sense, most people would consider them trivial if they are described as such. Puzzles aren't really a part of them [walking simulators]. It's more, just a series of steps to do within a puzzle.”
Conclusions from Chapters 2 and 3 similarly indicate that the walker games studied did not contain puzzles. As such, player feedback suggests WORLD4 presented an image of a puzzle game but was not a puzzle game experience. We may expand on this further, drawing upon a comment by Player 11:

Player 11: “The place feels like a puzzle to be explored, not solved. There are rules … that I am slowly discovering.”

Player comments suggest WORLD4 subverted expectations of being a walker and puzzle game genre. By presenting an image of both WORLD4 eluded clear comparison and compelled players to question the broader game structure and draw upon past experiences, and understandings of design conventions and patterns to adjust their expectations. Player comments questioning a presence and lack of ‘ending’ or explicit conclusion exemplify this subversion of genre distinction; other game genres such as open-world and sandbox game types (i.e. Sim City) not containing an explicit ‘end’.

This experience of questioning genre conventions was highlighted in Player 5’s comment that WORLD4 “plays with the player’s mind and forces you to think in a different manner than what you would normally”. Comments overall suggest a subversion of game genre expectations in player understandings of puzzle and walker games, and perhaps game conventions more broadly.

This suggests an overall ambiguity towards WORLD4’s genre, which relates to Gaver et al.’s tactic for provoking ambiguity of context: “add incongruous functions to breach existing genres” (Gaver et al. 2003, p.239), defined as splitting the design from original genres by presenting functionality in a new context. Without the explicit genre context WORLD4 provoked a revaluation as to what players considered genre conventions
and expectations. Similarities can be drawn between genre scrutiny observed in players with an experience of conceptual curiosity. To et al. suggest an experience of conceptual curiosity arises as players form mental models, for example when manipulating an object to explain “why the object behaves the way it does” (To et al. 2016, p.7).

Furthermore, we can draw parallels between WORLD4 as a subversion of the first-person puzzle genre like Antichamber (2013), as Dear Esther (2012) was a subversion of the FPS genre. As discussed in Chapter 2 Dear Esther was understood to be in conversation with FPS genre techniques notably the presentation of a game space as an explorable storytelling environment inspired by Half-Life 2 (2004). Similarly Gone Home (2013) is explicitly in conversation with the immersive sim genre (see Gaynor 2014), a genre in conversation with FPS and role-playing games (see Chapter 2). Comments suggest WORLD4 is in conversation with techniques associated with first-person puzzle games specifically its use of the first-person view and inscrutable game space.

In Chapters 2 and 3, Street was drawn upon in discussion of the walker as a counter-cultural form “about taking advantage of the spatiality and availability of game engines built for first-person shooters” and “made less in conversation with games with more ludic elements, and more in conversation with a much broader set of cultural objects, including music, literature, poetry, and architecture” (Street 2016).

I suggest if the walker is indeed a counter-cultural form and in conversation with existing genres and types of games, then the walker design style is one of subversive conversation with game genres. The walker’s common stylistic traits, discussed in Chapter 3, present a series of formal elements such as constrained interaction,
explorable 3D space and audio-visual focus consistent between walker games. These formal walker traits are not just stylistic but provide a highly specific, contextual design frame that constrains creative appropriation, translation, and repurposing of existing game genre traits, elements, or techniques, reframing them for an alternate experiential context. By highlighting the ambiguous relationship between genre conventions, design techniques, and gameplay experiences, walker design is used to subvert understandings of what games are. Furthermore, findings gesture towards the possibility of a new sub-genre derived from the walker.

**Theme 3: Summary**

In summary, Theme 3: Facilitating Subversion of Expectations describes player comments observed, which indicate *WORLD4* subverted understandings of 3D game space and game genres. Results suggest this subversion challenged player expectations in navigation and gameplay comprehension, compelling comparison to past game experiences. Players described *WORLD4*’s game space as being ‘like a puzzle’ and questioned whether the game experience itself fit walker or puzzle genre. Results revealed a broader type of solver’s uncertainty pertaining to the nature of the game experience, which manifest as players attempted to negotiate *WORLD4*’s many ambiguous traits, such as misinformation, and found a lack of clear resolution. My analysis of player responses suggest an ambiguity of relationship towards game genre and design conventions emerged through a subversive blurring of commonly defined traits. We can understand the walker design style is one of subversion, utilising its specific spatial-exploratory focus and formal design elements to subvert understandings of what games are.

Table 2 presents a summary of the findings in relation to the themes.
<table>
<thead>
<tr>
<th>Theme</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Designing Purposeful Inscrutability</td>
<td>This theme describes the experience players had with difficult, elusive and mysterious spatial elements designed in the game while playing <em>WORLD4</em> (6.1.1). These include: 1) the design of partial inscrutability; 2) designing for variable disorientation; and 3) the design of inscrutability as misinformation.</td>
</tr>
<tr>
<td>Shifting Meaning</td>
<td>This theme describes the experience of how players derived meaning from the game space and environmental objects while playing <em>WORLD4</em> (6.1.2). These include: 1) awareness of context; and 2) combined context and shifting meaning.</td>
</tr>
<tr>
<td>Facilitating Subversion of Expectations</td>
<td>This theme describes how <em>WORLD4</em> kept players engaged by subverting player expectations of game space, and game genre as a walker and puzzle game (see 6.1.3). These include: 1) subversion of space and 2) subversion of genre.</td>
</tr>
</tbody>
</table>
6.2 Strategies to Design Ambiguous Exploration Environments

Through the three design themes, my research aimed to understand player experience of \textit{WORLD4}. Based on the reported player experience, my design knowledge from creating \textit{WORLD4} (Chapter 4) and walker analysis findings (Chapter 3) I present a set of prescriptive game design strategies, which seek to guide game designers in fostering ambiguity in first-person exploration games. My strategies focus on ambiguity within a spatial-exploratory game design lens, referring to examples from my three themes to show use possibilities.

Game designers may use these strategies to design for ambiguity in their own exploration games and explorable 3D game environments. Experiences of curiosity may manifest through these strategies, based on the reported player experiences and ambiguity, curiosity, and game design literature referenced.

It is important to note my strategies do not present a strict design formula; this design model cannot encapsulate the numerous complexities and contextual factors that can affect a game experience, including those broader and socio-cultural. Each strategy seeks to highlight how ambiguity can be considered within spatial-exploratory contexts as a powerful resource and advance an understanding within the broader game design field. To strengthen my design contribution, I draw upon additional examples from existing games, through which I highlight how designers may potentially consider each strategy within different game design contexts.
6.2.1 Strategy 1: Consider using multiple sets of incomplete information to support investigation

Heightening player awareness of the game space is an important factor to consider for supporting investigative player focus during exploration. Results from Theme 1: *The Design of Purposeful Inscrutability* suggests player awareness was heightened because of multiple fragmented first-person views. This view technique (introduced in Chapter 4) presented an overt onscreen information gap by concealing the game space between onscreen sources, providing explicit ambiguity of information.

Players were observed to become increasingly aware of the limitations of each individual view as a reliable information source easily discerned, for example Player 9's description as “hypnotic”. This made it challenging for players to triangulate between each view during exploration and discern the environment, heightening their spatial awareness in noticing anomalies and differences.

![Figure 85: Screenshot, WORLD4.](image)

Note the fragmentation of environmental differences in game space, such as the drop in the floor in viewport 3.
This was observed in players frequently missing objects displayed in one view, only to discover at a later time. For example, Player 5 and Player 7's discovery of a hidden opening (see Theme 1: Designing for Variable Disorientation). Through these discoveries players became increasingly aware of the limitations imposed by individual views as reliable information sources. Consequentially players adopted a method of triangulation between each view to negotiate this limitation, heightening spatial awareness. This was observed in close comparisons of views to discern the environment and a revisiting of previously explored locations, for example, the discovery and identification of anomalies and differences by Player 5 and 7.

Analysis also suggests that a degree of disorientation was associated with this technique (e.g. players missing and memorising spatial elements). However, as discussed in Theme 1: Designing Purposeful Inscrutability, more confusing, disrupting or disorientating environmental visuals did not negatively frustrate all players (13 of 14). I posit that the disorientation was more tolerable due to the slower game pacing such as reduced movement speed.

As suggested by Gaver et al. using “imprecise representations to emphasize uncertainty” involves the ‘blurring’ of information to require users to fill in the information gaps that are “purposefully imprecise” (Gaver et al. 2003, p.238). Players may find interest and pleasure in negotiating this ambiguity and resolving information gaps. As suggested by Costikyan an awareness of hidden information may foster “a desire for exploration” to reveal and compare information differences (Costikyan 2013, p.92).

Game designers can heighten player focus towards the game space and its contents, in which perceptual and investigative curiosity may manifest, through the application
of multiple sets of incomplete information (see Theme 1: Designing for Partial Inscrutability). I recommend the following considerations when implementing multiple sets of incomplete information explicitly fragmented through multiple sources:

Each source of information must limit the extent of information conveyed. Sources may share similarities but must diverge enough to create a gap. Each source must be treated as mutually valuable in presenting worthwhile information to compel comparison by the player (e.g. using separate on-screen to locate pathways). By modifying the reliability of sources, their relationship may be altered so no single source is reliable. Additional sets of incomplete information may increase disruption and the likelihood of disorientation and features being missed. It is important to consider the design of the game space to support player adjustment and tolerance of potential disorientation, for example, providing opportunities for players to control their navigation pace.

Reduced temporal space is one such method for reducing friction that may emerge (for example, in existing walker games discussed in Chapter 3), allowing players to control their exploration pace. Reduced pace and an interconnected level layout may provide opportunities to return to previously navigated areas and potentially extend exploration, by compelling further scrutiny and comparison of sources, and may potentially encourage an over-interpretation of sources “to encourage speculation” (Gaver et al. 2003, p.237). Players may find pleasure in negotiating this explicit ambiguity of information in building towards a comprehensive picture and understanding across information sources during exploration.

Designers may consider altering the relationship between information sources to lessen disruption of navigation flow. This can be achieved through enabling more
supplementary relationship between information sources. For example, a classic method includes an in-game map interface that displays spatial information outside of the player’s main perspective. Priority is placed on a primary information source (player perspective) and additional sources serve to assist and supplement the primary sources limitations (e.g. a cartographical view of the game space). This technique is described as ‘partial maps’ by To et al., defined as a type of perceptual curiosity by making players aware of a knowledge gap; using the map to navigate but in doing so revealing hidden rewards and secrets not displayed (To et al. 2016, p.5).

Other potential approaches to using multiple sets of incomplete information to prompt investigation are numerous and may yield different degrees of ambiguity. Factors include the type of separate information sources, the extent of the knowledge gap withheld, emphasis placed on use of multiple sources, and the presence of a clear information hierarchy. Often this is through a layering technique, which reduces juxtaposition of information, although the principle of withholding remains.

The ‘Lens of Truth’ item in Legend of Zelda: Ocarina of Time (1998) layers information on top of the players’ existing perspective. Used in the Shadow Temple level the Lens of Truth is necessary to navigate the maze-like environment. When equipped, the Lens reveals false walls and openings, enemies, platforms, and points of interest. Within the confines of the Shadow Temple the players’ view is an unreliable source of information; this information gap is negotiated through activating and de-activating the Lens to compare what is revealed, often for the purposes of puzzle-solving. Players are encouraged to withhold frequent Lens use through disruptive enemy and hazard placement whose appearance is conditional to lens deactivation.
The Lens of Truth activated revealing hidden platforms leading to a boss room door, suspended over a black void.

*Deus Ex: Mankind Divided* (2016) presents a more complex approach to this technique, although less ambiguous in information withheld. The ‘Smart Eye’ item can be activated at any time modifying onscreen information by prioritising specific environmental elements, changing their appearance to highlighted silhouettes. An upgraded Smart Eye reveals hidden and critical objects and non-playable characters through surfaces, heightening and prioritising these by removing environmental occlusion. Activation also changes the material appearance of all other ‘non-critical’ game world objects by reducing their visual detail. As an additional and non-mandatory source of information the Smart Eye enhances to the regular first-person view, providing supplementary information for the purposes of stealth and combat gameplay mastery, and semi-obscuring other elements e.g. environmental narrative objects.
Figure 87: Screenshot, Deus Ex: Mankind Divided (2016) (Gamepur 2016).

An upgraded Smart Eye revealing enemy locations, and critical game world objects (e.g. explosive) for stealth and combat through solid surfaces (walls and floors).

A similar use of this technique although to a more ambiguous effect includes The Heart, an item in Dishonored (2012) and Dishonored 2 (2016). The Heart serves two purposes, one more explicit than the other. It is used to locate hidden objects throughout game levels, which become highlighted silhouettes visible through surfaces and cause audio-visual feedback when aimed at. The other is more ambiguous; when the Heart is ‘used’ it ‘speaks’ and whispered narration audio plays, often in reference to characters or object the Heart is pointed at, or a locations the player is in. In doing so the narration reveals secrets and narrative details that would otherwise remain entirely unknown to the player. This encourages players to use the Heart many times while playing, as whether or not the Heart with respond and what narration might play is highly ambiguous and may surprise. In doing so the Heart withholding a very specific layer of information, although supplementary to players’ regular view.
In the *Dishonored 2* (2016) level A Crack in the Slab players access a unique item, the Timepiece, which the level is designed around (discussed by Burford 2017). The Timepiece allows the player to view and physically shift through two different periods of time in the same location. The different time period effect is achieved by displaying two separate timer period game levels at once, from player positions that mirror one and other. This technique is both similar and different to *WORLD4*’s. When equipped the Timepiece provides a partial view of the other game level within the separate timeline, through an in-world window (see Figure 89). This window allows players to see where they are moving too and investigate safely in advance without being ‘present’ in the other time period level. The Timepiece encourages players to ‘sweep’ the environment, as neither environment can be fully ‘seen’ at once with one only partially viewable through the window. As such, the timepiece fosters ambiguity towards how each of the timeline levels relate and interconnect in navigation and narrative, which the player must understand and resolve so that they may progress.
The Timepiece item (pictured in left hand) used on a locked door. The preview view reveals the locked door as open within an alternate timeline; within the player’s view there are two different types of onscreen information, each showing two game levels as time-lapsed variations of the ‘one’ environment.

In horror game *Fatal Frame* (2001) the ‘Camera Obscura’ item allows players to shift their perspective from a third-person character view to first-person, seeing the game world through the viewfinder of a camera. The viewfinder acts as a lens into a ‘haunted’ version of the explored environment revealing the presence of ghosts and important points of interest, which although always present, cannot be seen outside of the first-person view. To explore and progress players must negotiate between the two perspectives; the third person camera provides a clearer view of surroundings for navigation, whereas the camera significantly limits the player’s field of view constraining their peripheral vision but must be used to defeat ghosts and observe points of interest. Each perspective in *Fatal Frame* delineates the type of information present, creating an ambiguity of what in in the environment is ‘unseen’ between each source. Unlike the Timepiece in *Dishonored 2* a lack of preview ‘lens’ of the environment creates uncertainty and tension in moving between each information...
source, notably an expectation of being surprised by sudden appearance of ghosts within our outside of peripheral view once the viewfinder is activated.

Figure 90: Screenshot, Fatal Frame (2001) (Fatal Frame Xbox Viewfinder, Fatal Frame n.d.).

An activated viewfinder in Fatal Frame capturing a ghost and an altered appearance of the surrounding environment.

6.2.2 Strategy 2: Consider removing feedback to compel spatial questions

This strategy describes two areas: 1) reduction of onscreen information feedback in the game world during player interaction; and 2) game progression feedback.

In Theme 1: The Design of Purposeful Inscrutability and Theme 2: Shifting Meaning players questioned environmental elements. Without feedback information to communicate an element's purpose players may become perceptually curious towards understanding it, supporting questioning and investigation of spatial and game boundaries. This strategy may foster an ambiguity of spatial information and uncertainty during navigation.
An opening and extended corridor beyond visible in viewport 2. Dotted lines indicate viewport divisions and edges of corridor.

1) Reduced information feedback suggests an alteration of solver’s uncertainty, defined as the type of uncertainty in puzzles or problems solvable by players (Costikyan 2013, p.25). A lack of information feedback may leave players uncertain about perceived problems they attempt to solve. This relates to Gaver et al.’s ambiguity tactic “expose inconsistencies to create a space of interpretation”, although within a navigational context (Gaver et al. 2003, p.238). Without feedback, limitations are imposed in how players may discern what the ‘correct’ steps are and how a solution may be quantifiably known. As discussed in Theme 1 this can manifest and contribute towards an impression of misinformation, as players may question their own understanding when considering perceived inconsistencies. This may result in a more curious and interpretive environmental artefacts and game space and can enhance inscrutable traits in visual and architectural elements of a level’s design.

2) Without progression feedback indicating the extent of the explored game space, player comments reveal uncertainty towards the game and spatial boundaries of the environment. For example, have all the locations been discovered, and have there
been any changes? Gaver et al. identify that by casting doubt on sources of information players must undertake an independent assessment, to understand a chain of cause and effect or if their more recent understandings match their past experiences (2003, p.238). Reduction of progression feedback may engage players in memorizing the environment, such as creating mental maps. As discussed in Theme 2 such a technique may compel ongoing exploration as to understand the relationship between elements, or to confirm prior knowledge.

I recommend the following consideration in removing audio-visual information and progression feedback:

Designers may consider reduction of audio-visual feedback, so the properties of an environmental element cannot be easily discerned on initial observation. Designers should consider how much of the game space they wish to withhold regarding player tolerance. For example, Theme 1 comments reveal a tolerance for withheld information. 10 of 14 players expressed enjoyment and acceptance in not having feedback; ‘not having knowledge was exiting’ (Player 8), such as not being able to fully resolve misinformation. Although questioning may increase in response to a lack of progression and information feedback, players may become negatively frustrated as the lack of certainty intensifies over play time. As noted in Theme 1, although players expressed enjoyment some expressed a desire for some feedback, a lack thereof resulting in negative frustration for one.

One such method of enabling players to negotiate reduced information feedback includes an introduction of game mechanics that assist players, allowing them to ‘test’ their surroundings through activated feedback in a limited capacity.
For example, the game world in *S.T.A.L.K.E.R.: Shadow of Chernobyl* (2007) is filled with anomalies difficult to perceive; dangerous hazards that when activated by proximity, can affect the player in various ways e.g. pulling into a gravitational vortex or create lightning strikes. In *S.T.A.L.K.E.R.* players have two items as methods for detecting anomalies: a detector which emits a sound, changing in frequency depending on player distance from an anomaly (unseen or not), and a throwable metal bolt that can activate an anomaly on impact. Both alert players to the presence of anomalies whose location and nature cannot be easily detected when inactive (unless players keenly observe their visual traits or have memorised their placement) allowing for circumnavigation. This allow unaccustomed players to negotiate a lack of feedback, which is used in *S.T.A.L.K.E.R.* to convey uncertainty and an expectation of danger when exploring its hazardous game world.

![A thrown metal bolt revealing and activating a lighting anomaly, one of many anomalies in *S.T.A.L.K.E.R.* are hard to detect, requiring keen observation. Note, some anomalies can be passed through once activated.](image)

This design strategy should be sensitively considered in context of the desired game experience. For example, Theme 3 results suggests players largely found a lack of overall feedback acceptable and even desirable because of WORLD4’s subversive and mysterious presentation of onscreen information (e.g. four first-person viewports), and navigable game world (e.g. reduced spatial depth and mazed layout). Types and the extent of feedback must be adjusted depending on the ambiguous effect desired, notably degree of which uncertainty and disorientation may manifest.

It is important to note that players will modify feedback to what they find desirable and suitable for their exploration experience, as discussed by Hamilton (2017) and Kuchera (2016), both of whom discuss the removal of navigation feedback (map and onscreen information) as desirable in *The Legend of Zelda: Breath of the Wild* (2017), allowing players to be “able to get lost in the world” (Hamilton 2017), by directing in-game focus towards game world surroundings, notably natural landmarks as navigation waypoints, and the overall aesthetic beauty of the environment.

![Figure 93: Screenshot, The Legend of Zelda: Breath of the Wild (2017) (Hamilton 2017).](image)

The Legend of Zelda: Breath of the Wild in-game view with all user interface options turned off except the health-bar. Note the multiple environmental landmarks (e.g. flying object in the background, and
tower closer to the foreground), and elevated mountainous terrain occluding distant locations.

These support an understanding of reduced feedback as desirable in enhancing the exploratory experience; however, as feedback was modified by players through provided options, this also indicates that such reduction was considered with respect to accommodating different player tolerance levels and expectations. As such, to accommodate preference and tolerance and not discourage exploration, designers may consider allowing players to modify variable types of feedback in-game. Suggestions include subtle progression indicators (e.g. changing environmental signs in recurring locations) and interface feedback (e.g. a guiding compass).

Alternatively, designers may consider finding an appropriate balance between ambiguous of information and progression feedback and guidance through their level design. For example, in *Shadow of the Colossus* (2005) players can use the sword item to direct their exploration towards locations containing a colossus. When used the sword directs a beam of light; the beam only focuses as the players’ aim is closer towards a colossus location; the further away the more it diffuses. The beam of light points through all environmental objects including terrain, directing player navigation towards a general direction, and it is ambiguous as to where the beam precisely leads. Consequently it is also ambiguous how players must negotiate the environment to reach their destination, and what they might encounter along the way.
The sword Light Beam in *Shadow of the Colossus* focused towards a colossus location, obfuscated by mountainous terrain. Note the further the player directs the beam away from a colossus location the more diffused and less directed the light becomes.

For example, as a player traverses the environment to reach a colossus location they may encounter numerous spatial tricks disrupting their navigation e.g. winding pathways, right angled blind corners, elevations, and occluded horizons. As the sword’s beam of light only points in a general direction, through terrain, players are forced to navigate in directions contradictory to what navigation feedback the sword provides in order to locate and negotiate the correct path. As such, a lack of explicit feedback from the beam results in an increase in ambiguity of information the closer players are to their destination. This fostering of ambiguity in the absence of guiding feedback emphasises environmental surroundings, highlighting spatial characteristics such as level architecture.

### 6.2.3 Strategy 3: Consider using spatial tricks to withhold environment reveal

**Theme 1: Designing Purposeful Inscrutability** indicates players were unsure of elements that presented inscrutability when encountered, such as false walls and the
removal of depth cues in rooms. Spatial tricks are initially difficult to discern by presenting overtly ambiguous information, encouraging players to work to verify them through interaction with the environment. This strategy describes the application of spatial tricks to visually occlude and spatially conceal the environment.

Figure 95: Screenshot, WORLD4.
A navigable room with a concealed hole not visible. The moving red orb, pink opening, and reduced depth distract from the hole. Dotted lines added for definition of viewports.

Tricks include elements that present inscrutability discussed in Chapter 4, such as disruptive visuals (e.g. unusual objects, reduction of depth cues) and concealed space (e.g. false walls, blind corners), which challenge player understanding of the game space. Tricks seek to disrupt clear readings of the explorable game environment, notably common spatial patterns in game level design, such as those identified in FPS games (see Hullet & Whitehead 2010) discerned by players over the duration of play. As such, additional factors can enhance unfamiliarity of tricks including Strategy 1: Consider using multiple sets of incomplete information to support investigation, and Strategy 2: Consider removing feedback to compel spatial questions, by reducing supporting information. When combined, spatial tricks present a series of perceptual
and navigation obstructions which players must slow their navigation pace to adjust to, breaking navigation flow. This is contrary to gameplay flow design theory discussed in Chapter 2 (see Salen and Zimmerman 2004, p.338), as identified in Theme 1, Designing for Variable Disorientation.

In doing so, solver’s uncertainty (Costikyan 2013, p.26) is present within spatial tricks as players adjust to understand their characteristics and spatial properties. Tricks may block expected functionality (Gaver et al. 2003, p.239) as they force player to question familiar representations of space e.g. common game level patterns. Results suggest that as players became aware of spatial tricks, there was expectation of additional tricks during navigation progression and when returning to explored locations. As identified in Theme 1, players worked to verify whether their expectations (e.g. adjusting their navigation movements and view orientation to trace the contours of 3D forms, or test surfaces for visual occlusion or solid physicality), indicating spatial tricks may foster adjustive-reactive curiosity (To et al. 2016, p.8).

I suggest game designers can utilize spatial tricks to extend the reveal of the game environment. When applying spatial tricks, I recommend the following considerations:

Designers may consider how an immediate intuitive understanding of the 3D space can be disrupted to raise questions as to the overt, immediate visual and spatial realities of the game. For example, imposter or false walls may deceive player understanding that all surfaces are visible and solid, and blended surface materials may conceal spatial boundaries and navigable paths. Designers should consider placement of spatial tricks; closer to the player’s starting location decreases the likelihood that players will adjust to the trick on initial encounter, if other navigation options are available. As noted in Theme 1 and 2, players unable to resolve the trick
will bypass it, but questions may remain as to how it can be resolved, foreshadowing the possibility of discoverable information. By providing opportunities to return to previously explored locations, players may extend their exploration and investigate further, if they believe they have new insight to understand or resolve it.

There are many combinations of trick to consider when designing a level. Different approaches may result in varying degrees of disruption, requiring designers to balance their level designs and test accordingly to gauge a desired experience.

![Image](image_url)

*Figure 36: Screenshot, *Dear Esther* (2012).*

A winding pathway through the tunnel network, around a chasm, towards a cave opening. Note the use of light in the opening for colour contrast to guide player focus.

For example, the winding cave corridors in *Dear Esther* utilise many blind corners and vertical drops to surprise players during navigation, in contrast to large open outdoor environments navigated prior. Despite their disorientating effect the level architecture employs constrained, non-branching geometry to direct navigation flow. As such, critical pathways are difficult for players to miss.
A hidden bar location accessible through one of the many networked rooms and corridors throughout the game level.

*Bernband* (2014) makes significant use of techniques similar to *Dear Esther* although within a denser and more complex networked level layout e.g. narrow spaces, extended corridors, right angles, and hidden nooks. These are employed to create moments of surprise, so locations may be missed during initial exploration and discovered on return, characterising its claustrophobic alien city setting.

In puzzle game *Antichamber* (2013) the disorientating effect of spatial tricks are heightened significantly through mixed combination and increased frequency. Tricks
used in Antichamber resemble similarities to *WORLD4* (as noted in Theme 1) such as a reduction of perceivable depth, and placement of difficult or complex tricks at earlier destinations that may be returned to. Other techniques in *Antichamber* do however differ, notably a use of non-Euclidian geometry; space that loops back on itself infinitely. Perceiving, negotiating, and resolving spatial tricks in *Antichamber* is central to its solvable puzzles and in advancing through the networked game world, and players may control their pace of discovery and tricks they choose to resolve.

Korsakovia (2009), created by the developers of *Dear Esther*, employs a similar use of spatial tricks in an increased frequency. These are applied with an intent to unsettle and disrupt clear perception of the game space, for a horror themed experience. Both *Korsakovia* and *Antichamber* are evident in their use of spatial tricks to create a highly ambiguous effect, although to varying degrees of success. Pacing in *Antichamber* is largely player controlled allowing for gradual adjustment, whereas in *Korsakovia*, players face a pressure of roaming monsters and precision-based platforming navigation. These elements of tension in *Korsakovia* are argued by Goodwin (2012)
as distracting from the ambiguity of the explorable environment and narrative elements, in contrast to the use of ambiguity in *Dear Esther*.

*Figure 100: Screenshot, Dishonored 2 (2016) (Carrier 2017).*

In addition, designers may consider the possibility of variable level architecture within their game level designs as a method for employing spatial tricks. For example, the Clockwork Mansion level in *Dishonored 2* contains transforming rooms, which may be activated by an exploring player. This adds an additional layer of complexity to navigation as the level transforms around the player, at times moving their position and orientation. To accommodate player adjustment the Clockwork Mansion level was designed in specific ways to balance the disorienting effect, as discussed by the lead level designer:

“In this level, the player is put in a situation where their orientation is changing constantly. This was a huge risk! So it was extremely important to let the player be able to construct a mental picture of the house while they’re progressing. We tried to avoid long and tight passages that go in and around the walls because in our game that’s the best way to cause confusion. Players can also go backstage, a bit like in the
Portal series, and see how it’s all working while trying to reach their goals” (Carrier 2017).

Alternatively, designers can intensify the disruptiveness of a trick by adding an algorithmic component, for example, the procedural generation of wall surfaces in Catacombs of Solaris (2016). In Catacombs the level layout changes as players explore, generating when player movement and orientation is still. This change happens without any discernible feedback; harsh angles of walls and use of material rendering techniques obfuscate visible change, with the intent of disorientating navigation, and raising question to the nature of the environment.

The more inscrutable the trick the greater potential for disorientation, which can be assessed through rapid player testing, so designers may learn what can be considered desirable. There is no ideal use of spatial tricks, however to gauge an appropriate use for an exploration experience, designers must consider the relationship and tension between an intended degree of ambiguity and accessibility of navigable space.
6.2.4 Strategy 4: Consider using misinformation to disrupt clear understandings

Theme 1: *Designing Purposeful Inscrutability* suggests players encountered elements which gave an impression of legibility in being learned, understood, or solved, but were ultimately unintelligible and had no solution. This strategy encompasses both environmental narrative and spatial navigation elements and describes misinformation as a useful method for disrupting player understanding of the game world by impressing intricate, mysterious, and contradictory environmental ambiguity, for example, the disorientating ‘cone room’ and blue seam glitch (see Theme 1, *Designing for Inscrutability as Misinformation*).

![Figure 102: Screenshot, WORLD4.](image)

The visually noisy animated cone room.

This relates to Gaver et al.’s suggestion to cast doubt on sources to provoke an independent assessment, and to implicate incompatible contexts to disrupt preconceptions (Gaver et al. 2003, p.238). In this context, spatial tricks may present misinformation as ‘solvable’ and compel players to question the nature of the game space and decide for themselves if misinformation should be given credence based
on their interpretation. In doing so players must rethink their assumptions about the perceived and possible intentionality of the design, for example the potentiality of genre conventions, and are encouraged to confront the possibility of no resolution. As a disruptive element that does not yield clear or explicit understandings, misinformation is conducive towards fostering experiences of curiosity about the complex or ambiguous (To et al. 2016, p.7).

When using misinformation, I recommend the following considerations:

Misinformation can be considered as a type of designed deception. This approach includes an alteration of game world elements e.g. objects, that are typically clear or intuitive in presentation. Alterations must present an initial impression of legibility, for example, placed in proximity to clearer or negotiable elements like spatial tricks. This can imply an association or relationship between elements, thereby supporting deception as solvable or understandable e.g. a visible but impassable opening nearby another visible but passable opening.

Misinformation should never be explained or provide an answer or solution. Elements associated with the misinformation should remain entirely ambiguous as to their purpose and meaning. Reduced feedback (see Strategy 2: Consider removing feedback to compel spatial questions) may support this ambiguity. Allowing unintended glitches and anomalies to surface can add variability in misinformation. Alternatively, designers may consider randomization or procedural approaches. However, designers should be aware that high frequency of misinformation may create unintelligibility and disorientation which may inhibit or prevent any possible meaning being derived. For these reasons it is important for designers to consider
misinformation to subvert player expectations of familiar designs and established design patterns within the game context, to achieve an ideal disruptive effect.

Examples of explicit misinformation in game design is often uncommon due to a disruption of conveyed or known rules of the game and game environment. As such, misinformation when used often concerns a presentation of altered states, uncertainty, or threats, by obfuscating the rules of the played game system or as a red-herring in the unfolding narrative. For these reasons prominent use of misinformation often tends to appear and be used within a horror themed context, due to the tension its disorientating effect may give rise to.

Figure 103: Screenshot, Gone Home (2013).

Séance objects discoverable within a hidden section of the family home, with the photo of the long since deceased family patriarch placed on top.

Gone Home (2013), for example, presents misinformation throughout its exploration experience largely as fixed, environmental details encountered. Use of ambient audio such as rain, thunder, wind, and creaking floorboards, dim lighting, and a breaking lightbulb act as subtle elements of misinformation to suggest the experience is that of a horror story. In addition, players may discover hidden locations containing specific
points of interest containing misinformation, which reinforce the suggested horror theme e.g. the hair-dye blood splatter (see Chapter 3, Ambiguity of Context), a jagged wooden crucifix, and a table inscribed with a pentagram and séance objects. These elements of misinformation within a collective context act as narrative red-herrings for narrative subversion, and to mislead player expectations of the game experience by influencing how adjacent in-game information is perceived throughout navigation. In doing so misinformation in Gone Home is used to sustain uncertainty and questioning over an extended period of time.

![Figure 104: Screenshot, Dear Esther (2012).](image)

A ghost figure in the distance, within the middle of the player view. Note the subtle ambient illumination surrounding the figure and radio tower.

Dear Esther, presents a use of misinformation through randomization or procedural approaches, although more strictly for opaque narrative purposes. Examples of misinformation include the semi-randomisation of ghostly figures, environmental objects, and the narrator’s monologue, for the purpose overall ambiguity in contrast to the largely fixed navigable game environment.
A more complex example of partially randomised and fixed misinformation includes action game *Hellblade: Senua’s Sacrifice* (2017), which makes significant and noteworthy use of misinformation throughout its design to convey an experience of psychosis (see Ings 2017). Elements include audible voices that comments on and advises towards players actions and events in the game, often providing contradictory information that is “still right half the time so you don’t follow their advice at your own peril” (Gault 2017). Other uses of misinformation include environmental tricks including characters and 3D objects changing in appearance depending on player view orientation, specifically if an object is within their field of view, and surfaces gradually blending between two different types of texture depending player distance and orientation e.g. a wall of bricks and seeing eyes. In addition, *Hellblade* prominently surfaces misinformation to players through an onscreen notification concerning character death; that each time the character dies players risk losing game progress. This notification is untrue however, although the player character appearance changes upon death (in itself a form of misinformation) the loss of game progress does not happen. As discussed by D’Argenio (2017) this use of misinformation creates a
threatening expectation of loss that is ultimately unfounded, fostering tension and paranoia as part of the experience of psychosis conveyed.

6.2.5 Strategy 5: Consider designing for spectacle to support an evocative response

In Theme 2: Shifting Meaning, players encountered environmental elements whose characteristics evoked a response (e.g. the large central hub atrium and red spheres in WORLD4). Parallels may be drawn with the design of narratively evocative game environments that impart meaning through their visual and architectural stylings (see Pearce 2007; Jenkins 2004). My results suggest these were memorable and significant moments influenced by visual and spatial characteristics, and stylings in juxtaposition to other in-game locations. For example, characteristics discussed in Chapter 4 include contrasts in colour and shading, shape and scale to style locations as ‘districts’, and uniquely styled point of interest (e.g. the sphere room, see Figure 106).

This strategy describes the use of spectacle to support an evocative player response, that may foster interpretive narrative readings without incorporating a specific storytelling focus or narrative premise. We may relate this to Gaver et al.’s tactic in pointing out things without explaining why to encourage consideration of interpretive significance (Gaver et al. 2003, p.239).
Figure 106: Screenshot, WORLD4.

The hidden ‘sphere room’ featuring animated spherical shapes, reduced depth, and a repeating heartbeat sound. Players described this room as claustrophobic, unsettling, and memorable.

To design for spectacle, I recommend the following considerations:

Designers can juxtapose spatial elements in a localized area, specifically in-game stimuli – visual, spatial, animation and audio – that may be exaggerated in contrast to surrounding locations or elements. It is important to consider the placement of elements in spatial composition e.g. distance between elements in relation to the player perspective’s field of view, and the implications of using positive and negative space can draw player focus towards spectacle elements, to create a significant moment.

For effectiveness, designers must consider the transitionary state in which players will reach, and initially encounter and observe spectacle elements, namely build-up and staging (see 4.3.2)). For example, using leading sight lines to direct the player view towards a horizon, and extended travel distance to create anticipation before an encounter. Obscured sight lines and visual occlusion techniques may create surprise in a sudden encounter (e.g. abrupt or blind corners discussed in Chapter 4), and
anticipation by partially revealing concealed points of interest. This does much to frame any juxtaposition on initial encounter, following the previous area.

![Figure 107: Screenshot, Dear Esther (2012).](image)

Although my focus is on spatial design elements, in addition, location-based audio can add a memorable layer of information to characterise locations and significant moments. For example, as discussed in Theme 2, an impression of a ‘body’ or ‘machine’ expressed by players was derived from a contextual association between audio, visual and spatial elements within the ‘atrium hub’ location. Proximity-based audio may yield a similar effect, in addition to providing an additional source of information in guiding player view and navigation movements and may create anticipation and exploratory interest when used outside of clear sight lines.
Players emerge from an enclosed train station into a large city square. Placement of the station awnings and buildings on the far side of the square frame the obelisk and monitor in the middle-ground, and large alien tower in the background. Note the ambient fog in opening between buildings obfuscating the base of the tower.

Examples of spectacle include *Dear Esther* (2012), which frequently utilises gradual transitions through extended and constrained pathways in level geometry, to frame a vast horizon and open space beyond a geographic opening, in juxtaposition to the space it is viewed from. This gradual, extended transition impresses spatial juxtaposition sustaining the moment of spectacle. The technique is employed in many games, including first-person shooters, notably *Half-Life 2* (2004). Spectacle in *Half-Life 2* is often used to highlight important points of interest, such as landmarks or hostile enemies. When used a clear division between figure and ground is frequently visible, through a use of clear and occluded sight-lines to direct player focus and enhance the juxtaposition effect during transitional navigation.
The reveal of Anor Londo in *Dark Souls* uses many spectacle techniques at once, notably gradual staging through a winding series of stairs that descend towards the central cathedral. Prior to this moment of spectacle, the cathedral spires are visible throughout the game world but are obfuscated by surrounding mountainous terrain.

*Dark Souls* (2011) is noteworthy for employing this strategy to great effect. Moments of spectacle are enhanced significantly by extending the reveal of elements throughout the duration of game world exploration. These often correspond to significant locations, accessible at later points in the game but visible earlier. Locations can be seen at certain elevated viewpoints discoverable during exploration, but are not spotlighted, and instead relegated to the background and often obscured by objects or terrain. Although significant locations are recurring visual features, they remain out of reach for extended periods of time.

As players gradually chart out the broader game space an awareness is developed towards their presence, including their position relative to various locations discovered within broader game world; a form of spatial foreshadowing. The immediate moment of spectacle when arriving at a special location is not dissimilar to *Half-Life 2* or *Dear Esther* but is enhanced by this extended and prolonged transition. The juxtaposition
in the reveal moment is more significant, as players can finally impart accumulated knowledge of spatial context acquired through extended exploration time, finally filling gaps within their mental map of various locales.

Figure 110: Screenshot, Dear Esther (2012).

In addition, sudden and unexpected transitions can enhance moments of spectacle. For example, in *Dear Esther*, within the winding underground cave network players are guided to fall down a large vertical cavern, plunging into the water below. As the in-game character cannot be ‘damaged’ or harmed while exploring, the sudden transition on impact with the water is made all the more surprising. Once under the surface the cave network vanishes revealing a murky underwater highway. In the distance a crashed car with bright headlights draws view orientation into focus, in an otherwise ambiently lit and sparse environment. This moment is explicitly surreal in contrast to previous locations in *Dear Esther*, and the significance and gravity within of this moment of spectacle is reinforced by the suddenness of this immediate and unexpected transition.
6.2.6 Strategy 6: Consider breaking game patterns to support deeper interrogation

Theme 2: Shifting Meaning suggests that players applied arbitrary meanings to environmental patterns in or near artefacts based on context. When the pattern was disrupted or broken, players changed the meanings they attributed. As noted in Theme 3: Facilitating Subversion of Expectations, breaking of patterns may subvert expectations of space and game and compel broader speculative questioning.

This relates to Gaver et al.’s tactic for provoking ambiguity of relationship: offer unaccustomed roles to encourage imagination (Gaver et al. 2003, p.239). The pattern implies a narrative of use in functionality and meaning derived. By breaching the pattern, players may reflect on meanings they had attributed towards it and its idiosyncrasies. An effect may potentially give rise to an ambiguity of relationship and speculative curiosity about the complex and ambiguous (To et al. 2016, p.7) as players are spurred on to question patterned elements in relation to their own understandings or expectations. For example, player encounters with the red spheres (see Figure 111) discussed in Theme 2: Shifting Meaning, which over time were perceived as containing multiple narrative and navigational meanings, derived from multiple encounters.

This strategy describes the breaking of environmental patterns through an introduction of variations and inconsistencies, to support ongoing interrogation. I recommend the following considerations:
The red sphere displayed on a plinth, also discoverable in three other separate locations.

Player awareness of a pattern may be heightened through application of the pattern in varied contexts. The pattern can be broken through the introduction of obvious inconsistencies in pattern variation. Examples include an alteration of audio-visual or spatial properties such as changes in associated audio, scale, colour, material surface or animation.

Player awareness of a pattern may be heightened through application of the pattern in varied contexts, for example using visual or spatial symbols in game levels (Totten 2014). The pattern can be disrupted through an introduction of obvious inconsistencies in pattern variation, analogous to consistencies in the pattern established prior. Examples include an alteration of audio-visual or spatial properties of a repeating location or 3D object e.g. associated audio, scale, colour, surface material, or animation. By placing pattern breaks after the pattern has been established, the break will appear more clearly analogous to consistencies perceived or known by the player. Unless the break is made apparent, the inconsistency will never be perceived or
known. Recurring locations can heighten awareness of patterns and breaks through repetition, for example repeated player encounters with red sphere objects and vertical shafts in WORLD4, through recurring pathways and locations. This increases the chances of players becoming aware of patterns and breaks through extended spatial repetition.

Breaks may be repeated for further variation and increase an ambiguous effect, however frequent breaks may result in unintelligibility and dilute interpretive connections, so that meaning cannot be confidently derived by players. Pattern breaks are effectively used in existing games often in less ambiguous contexts to surprise and subvert player expectations, often towards specific level design patterns, visual traits, and discoverable objects.

![Figure 112: Image (Regular versus mimic chest n. 2018).](image)

A player created guide showing the visible differences between non-mimic (left) and mimic (right) chest models in *Dark Souls*.

For example, in *Dark Souls* (2011) the explorable game world is filled with discoverable treasures chests containing items. Treasure chests initially found in *Dark
Souls are often associated by players with an expectation of forward progress due to the benefits they yield. However, chests are also used in Dark Souls’ level design as lures playing on player focus on the object, and are often placed in hazardous locations, or near dangerous monsters placed out of sight, breaking the pattern. A player that might be ambushed by a monster when opening a chest, will come to associate it as a sign of reward and danger, learning to look for contextual level elements surrounding the chest before approaching e.g. dim lighting, openings, and elevated platforms.

Furthermore, the pattern chests present is breached at later points in the game; chests in Dark Souls can be false, appearing in locations players may expect these to be placed, but masquerading as monsters that mimic their appearance. An unsuspecting player whose character opens a mimic chest will likely result in their character’s death. If a player attacks an unopened chest to test if it is a mimic, there is a chance it will break and destroy the items inside. Although many players have become accustomed to locating this break within the chest pattern, through spotting differences in 3D models and animation, this additional break in the pattern fosters additional uncertainty towards the chests in how players may approach and interpret them. Consequently such breaks furthers ambiguity in possible meanings associated with the object.
Figure 113: Screenshot, Layers of Fear (2016) (Bloober Team SA 2016).

A transformed corridor with altered surface textures and lighting.

Comparatively, horror themed walker *Layers of Fear* (2016) uses a recurring environment to enhance the presence of pattern breaks within the game world as players explore over time. Pattern breaks in *Layers of Fear* often concern decorative objects such as paintings or house-hold items which alter in appearance at specific points during game progression, discussed by Marak:

“In terms of experiential aspects of *Layers of Fear* this means that the protagonist’s obsession with the past, returning time and again to the same places, objects and thoughts, results in the player being unable to exit certain locations or encountering the same objects numerous times, although sometimes in different forms” (Marak 2017, p.9). In addition, the level layout of the environment changes the spatial pattern that has been learned: “furthermore, depending on the direction which the avatar faces, the objects examined and the layout and the appearance of hallways and rooms change as well” (Marak 2017, p.9).

Ambiguity is used to convey uncertainty towards the explorable game space as an exploratory narrative environment, which reflects player character’s deteriorating
mental state. The world like *Dear Esther*'s island is framed ambiguously, initially as physically constant and grounded environment and through such pattern breaks, as a (player) character’s subjective interpretation, or potentially, a dreamscape. Such breaks raise question to the broader context to the world and a players’ prior interpretation.

**Strategies: Summary**

To summarise this section, I have articulated six strategies for fostering ambiguity in the design of exploratory game environments, using the themes identified as affecting player experiences playing *WORLD4*. Unlike the more descriptive themes described in 6.1, these strategies are prescriptive. Game designers can consider using the following ambiguous exploration environment strategies identified:

1) Consider using multiple sets of incomplete information to support investigation

2) Consider removing feedback to compel spatial questioning

3) Consider using spatial tricks to withhold environment reveal

4) Consider using misinformation to disrupt clear understandings

5) Consider designing for spectacle to support an evocative response

6) Consider breaking game patterns to support deeper interrogation

Table 3 provides an overview of the strategies identified and their descriptions.
### Table 4. Consolidated findings, design strategies.

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>Use multiple sets of incomplete information to support investigation</strong></td>
<td>This strategy describes distributing onscreen information across multiple sources, to foster an overarching ambiguity of information. I discuss introducing information inconsistencies for comparison, to heighten player awareness of hidden information and support an investigative focus.</td>
</tr>
<tr>
<td><strong>Remove feedback to compel spatial questions</strong></td>
<td>This strategy describes the reduction of information feedback in interaction and progression, to foster ambiguity of information. I discuss removing audio-visual in-world feedback and onscreen progression feedback for uncertainty about spatial properties and boundaries of navigation.</td>
</tr>
<tr>
<td><strong>Use spatial tricks to withhold environment reveal</strong></td>
<td>This strategy describes the application of spatial tricks to slow navigation and extend ambiguity of information. I discuss using visual occlusion techniques to disrupt intuitive spatial knowledge, heighten spatial navigation and compel player adjustment.</td>
</tr>
<tr>
<td><strong>Use misinformation to disrupt clear understandings</strong></td>
<td>This strategy describes the use of misinformation to disrupt game space understandings and foster an ambiguity of information and context. I discuss using unintelligible and deceptive spatial characteristics in proximity to clearer and more resolvable elements, to create uncertainty about the game space.</td>
</tr>
<tr>
<td><strong>Design for spectacle to support an evocative response</strong></td>
<td>This strategy describes the use of spectacle to support an evocative player response and foster an ambiguity of context. I discuss using juxtaposition, contrast and exaggeration to elicit an emotional response that may lead to arbitrary narrative readings, without incorporating a storytelling focus or narrative premise.</td>
</tr>
<tr>
<td><strong>Break game patterns to support deeper investigation</strong></td>
<td>This strategy describes the breaking of in-game environmental patterns to foster an ambiguity of relationship within the game space. I discuss introducing variation and inconsistencies to support interrogation of the environment and speculative questioning of the game world.</td>
</tr>
</tbody>
</table>
6.3 Conclusion

This chapter concludes research undertaken in Chapters 4 and 5 to address the following question:

How can these design attributes be used to design first-person walker games and 3D games more broadly?

To undertake this investigation in Chapter 5 I recruited 14 player study participants to play the walker-inspired exploration game *WORLD4*, whose design utilised the walker design themes (discussed in Chapter 4). Through a two-stage qualitative playtest, the player experience of *WORLD4* was investigated. After game sessions, participants engaged in an interview or questionnaire where they answered questions relating to their game experience. Playtest sessions were transcribed for raising player comments and observations. I conducted open-coding and thematic analysis of the transcribed data, from which I identified 90 category codes. Through comparative groupings, seven dominant category codes were identified, and codes were organised into three overarching themes that affected player game experience. These included the fragmentation and disruption of spatial information, shifting meaning in the understood context of 3D artefacts, and subversion of spatial and game genre conventions.

In 6.1, study results enabled me to develop three themes which highlight and discuss *WORLD4*’s game exploration experience: 1) Designing Purposeful Inscrutability; 2) Shifting Meaning; 3) Facilitating Subversion of Expectations. I observed how visually and spatially inscrutable elements onscreen and in-environment heightened players’ perceptual awareness. Players’ early gameplay exploration became perceptual events that were at once curious and compelling, and appeared to subvert spatial and game
understandings. Exploration activity appeared to be characterized by a sense of curiosity in resolving uncertainty. To make sense of uncertainty, players applied arbitrary meanings to environmental artefacts and spatial misinformation, as an overall strategy to make sense of the game world. By not making the relationship between navigation and spatial elements obvious, and by removing explicit audio-visual and progression feedback, investigative exploration was afforded. This effect exceeded my expectations in terms of both involved spatial navigation and narrative interpretation.

In response to the three themes, I have created six strategies as prescriptive design guidelines, discussed in 6.2. Each strategy builds on understandings of ambiguity previously discussed, which have been identified within existing walker game design. The framework seeks to provide a spatially focused approach to game design that begins to address areas of designed ambiguity typically not prioritized within game design literature. Strategies intend to offer game designers some useful, practical guidelines for fostering ambiguity in the design of exploration games and explorable 3D environments. To address potential limitations strategies as broader, generalizable game design knowledge that may be practically applied, I have drawn upon existing game design examples other than WORLD4. Examples provide specific insight that ground findings in alternative game design contexts, to highlight how designers may approach and consider different uses of the supplied guidelines.

My guidelines suggest specific techniques for fostering spatial ambiguity by highlighting specific areas of consideration; these include: limiting clarity through information fragmentation and feedback removal; disrupting navigation flow through occluding the environment and introducing misinformation; and supporting speculative readings through environmental juxtaposition and pattern-breaking. Strategies
highlight how the relationship between in-game spatiality and navigational information may be manipulated through ambiguity, making the environment more resistant to player scrutiny during navigation, and being comprehensibly ‘known’ when investigated and reflected upon. My findings suggest this may manifest during player gameplay as an extended experience of exploratory curiosity, and discussion reveals the potential experiential benefits of designed ambiguity in creating richer exploration experiences.
Chapter 7: Conclusion

7.0 Thesis Summary

I have explored the walker within the context of game design through theoretical and practice-based investigations, to expose and highlight their unique experiential and exploratory design traits.

This study was motivated by a desire to understand the walker genre, which has challenged accepted game norms by pushing back against game design conventions. The walker emphasises looking and moving as rich interactions, complicating notions within foundational game design theory. Such theories place emphasis on values considered ubiquitous within games, including mechanistic rule-based design and challenge-based gameplay (e.g. Salen & Zimmerman 2004), and optimal ability and difficulty balance (e.g. Chen 2006).

Although there has been healthy critical conversation about walkers and their cultural reception, debate surrounding the genres emergence and popularity reveals a significant knowledge gap within the design field. This gap has highlighted the limitations of foundational game design, and an absence of suitable literature in unpacking and understanding the walker style, to suggest characteristics and principles.

By undertaking a specific design analysis of a particular key moment in the genre, 2012 – 2013, we may try to articulate particular observations of walker design. In doing so we can better understand the distinct experiences walker games elicit, and their design characteristics. With this knowledge we may further our understanding of 3D games and exploratory game environments more broadly, outside of established
theoretical knowledge. To begin my research sought to address the following two questions through a study of walker gameplay:

What gameplay experiences do walkers elicit, and how might designers understand these experiences?

What are the game design attributes that engage players to explore 3D walker environments?

My study of gameplay in four key walker titles revealed four shared design themes: 1) Player Interaction; 2) Temporal Space; 3) Player Focus; and 4) Ambiguity, further contextualised within current walker developments. Findings indicates that walkers lie outside of conventional game design by reframing the game experience as one of ambiguity during exploration; they cannot be ‘solved’, mastered, ‘gamed’, or clearly understood as environmental narratives, yet we still wish to understand them. Gaver et al. defines ambiguity in the context of design as an element in the interpretive relationship between people and artefacts (Gaver et al. 2003).

Evidence suggests designed ambiguity may thwart easy interpretation and can provide subjective, introspective experiences in which an experience of extended curiosity may manifest. However, I have observed, along with Gaver, that ambiguity is frequently reduced within the design of interactions (Gaver et al. 2003; 2004; Gaver & Sengers 2006). Although this trait is present in existing game designs, it is intensified and extended within walker contexts, in an absence of overt mechanical complexity and gameplay structures as focal points. It has been argued that game design is not conducive towards this trait (Gaver 2015), however the walker reveals significant complexity within this distinction.
Based on findings deduced from my walker gameplay experience study in Chapter 3, I sought to address a new question utilising four common themes:

How can these design attributes be used to design first-person walker games and 3D games more broadly?

To address this question, I adopted an alternative practice-based research approach, allowing an implementation of these theoretical findings so they may be understood as generalisable and applicable game design knowledge. As part of my practice-based research I used a research-through-design approach to create an original game, *WORLD4*, a walker-inspired multidimensional exploration game. In a two-stage player study with 14 participant players, qualitative data was collected in order to analyse *WORLD4*’s design in depth. Limitations in participant numbers are addressed through a thorough in-depth interrogation of each participant player’s game experience, scrutinised through an open-coding and thematic analysis process. In doing so I present a methodology for game design researchers, that adopts remote testing approaches from indie game developers for scholarly research.
My design goal was to create a game that prioritised spatial-exploratory ambiguity within its design, and to utilise the four walker design themes previously identified. Through five major design features WORLD4 provides a stimulating exploration environment that fragments onscreen and in-world information, coupled to the player’s navigation and perception abilities. WORLD4 enables this by incorporating variable inscrutability onscreen and within its 3D environment. This is achieved through three main themes specific to WORLD4 that affected the players’ game experience: the fragmentation and disruption of spatial information; an abstraction of context in 3D artefacts; and the subversion of spatial and game genre conventions.

Observations of players’ exploratory activities and comments while playing WORLD4 were categorised into 3 dominant themes highlighting the exploration experience: 1) Designing Purposeful Inscrutability; 2) Shifting Meaning; 3) Facilitating Subversion of Expectations. I observed how visually and spatially inscrutable elements onscreen and in-environment heightened players’ perceptual awareness. Players’ early gameplay exploration became perceptual events that were at once curious and compelling. Perceptually inscrutable elements appeared to subvert spatial and game understandings, and to encourage investigative navigation moments. This activity seemed to be characterised by a sense of curiosity in resolving uncertainty, and doubt when uncertainty remained. To make sense of uncertainty, players applied arbitrary meanings to environmental artefacts and spatial misinformation, as an overall strategy to make sense of the game world.

By not making the relationship between navigation and spatial elements obvious and by removing explicit audio-visual and progression feedback, investigative exploration was afforded. Chapter 6 indicates how this ambiguous approach exceeded my expectations in terms of both involved spatial navigation and narrative interpretation.
To conclude my research, I have structured a framework of six prescriptive game design strategies based on the themes derived from my analysis of the qualitative study data. Each strategy builds on understandings of ambiguity such as those of Gaver et. al. (2003) and To et al. (2016) that I have identified within walker games. My framework seeks to provide a spatially focused approach to game design, that begins to address areas of designed ambiguity typically not prioritised within design literature. I draw upon existing game design examples to provide further insight towards broader, different contextual approaches when considering each strategy. Insights within this framework may offer game and game level designers some useful guidelines when considering the potential experiential benefits in fostering ambiguity, in the creation of spatially-focused exploratory game environments within walkers and other 3D exploration-focused games.

The design strategies suggest specific techniques and considerations for fostering spatial ambiguity by highlighting specific areas of consideration. Strategies include: limiting clarity through information fragmentation and feedback removal; disrupting
navigation flow through occluding the environment and introducing misinformation; and supporting speculative readings through environmental juxtaposition and pattern-breaking. These strategies highlight how the relationship between in-game spatiality and navigational information may be manipulated through ambiguity, to make the environment resistant to scrutiny and being comprehensibly ‘known’. This may manifest as an extended experience of exploratory curiosity.

7.1 Contributions and Future Directions

My research contributes to a deeper understanding of the walker within the game design field, methods for conducting scholarly indie game design research, and designing ambiguous exploration environments. The results suggest further opportunity for game design practitioners and researchers, especially those interested in designed ambiguity and spatial navigation. We can identify three main directions for future research.

7.1.1 Advancing Ambiguity

WORLD4 raises interesting questions around designing ambiguous exploration experiences for engaging spatial navigation. We could investigate the extent to which ambiguity may be heightened and made even more resistant to scrutiny, for example by the application of new techniques previously noted, such as the use of conditional rendering and rules (e.g. timers, activation triggers, ‘look at’ state changes and manipulation of object layers). These may further disrupt navigational interaction and flow conventions and further reveal an underlying design complexity. We might learn whether curiosity is further extended or diminished as ambiguity is made more extreme.
Furthermore, the discarded \textit{WORLD4} prototypes present their own questions in relation to designed ambiguity, such as the fragmentation of information through interfaces and the introduction of social context. We could investigate how a ‘shared’ ambiguity can be fostered, that may reveal a change in how curiosity of various types manifests within a non-solitary social environment.

A social dimension and/or adaptive generation of the game environment could further our understanding and raise questions as to what degree of ambiguity is desirable or undesirable within exploratory experiences. We may also consider what constitutes ‘good frustration’ and ‘bad frustration’ within this context, and disorientation as its own experiential pleasure. This could advance broader understandings of ambiguity as a design resource within the fields of game design and design research, such as alternative approaches and considerations in fostering exploratory activities that compel introspection or subjective readings. These might further crystallise the relationship between ambiguity and curiosity specific to game design.

\textbf{7.1.1 Ambiguity as Game Design}

The use of ambiguity to subvert game design conventions is of particular interest for further research. By disrupting clear gameplay readings, ambiguity within the walker exposes complexity in the relationship between games and more self-directed play, for example, player interpretations of \textit{WORLD4} as a puzzle game that could not be solved. We could further explore ambiguity as a subversive lens for game design more broadly beyond the walker context. This might further challenge ubiquitous game design understandings such as flow and mechanistic rule-based design as proposed in foundational game design texts. Potential avenues for game design investigation include the application of strategies for fostering ambiguity within more ‘gamey’
contexts, such as other design styles and genres. This might provide more generalisable insights into designing ambiguity for game designers and broaden theoretical and practical game design understandings beyond culturally dominant values.

7.1.2 New Game Design Research Methodologies

The WORLD4 player study approaches reveal considerations for design researchers in adopting contextually aware methods from outside of traditional scholarly research, for example indie game testing methods for design investigation (de Jongh 2017; Daviau & Leacock 2017). Future research could explore indie methods within current game-making practices that may contribute to scholarly research in game design and improve our understanding of which methodologies are appropriate within an emerging field such as game design research.

For example, WORLD4 could be distributed to a broader public audience to increase the breadth of data collected and engage more intimately in indie game-making practices as a research method. These methods might provide understanding into what we could consider scholarly within the field when seeking meaningful design insight. Such exploration might impart understandings that enhance game design research as its own field with appropriate methodologies applicable to broader game design practices.

7.2 Concluding Remarks

Discussions surrounding the walker such as those of Cross (2015; 2016), Kill Screen Staff (2016) and Irwin (2017) reveal the interpretive challenges that emerging styles and genres present to the game design field. Cross states the walker has “made space
for developers to clear all the excess and only restore those interactive bits that were truly needed, rather than assuming that a game must always have x, y, and z" (Cross 2016). To investigate that space, however, foundational game design literature such as Salen and Zimmerman (2004), Schell (2008) and Koster (2004) provides little insight. What remains and how the experience may manifest can only be assumed. This implies a supposed incompatibility between emerging styles of game that challenge traditional design orthodoxy and what can be understood to be game design.

Game design researchers are in a unique position to take a proactive role in challenging popular orthodoxy and shaping future design knowledge by catalysing theoretical questions and ideas through creative design practice and multifaceted, contextually aware approaches.

This research suggests there are benefits to be gained when researchers adopt broader, more flexible approaches for design investigation, insight and innovation. Projects such as WORLD4 may help shape the design of ambiguity within exploration environments. WORLD4 came about in response to questions that could not be addressed through conventional game design frameworks. As Pinchbeck points out, researchers adopting practice may reveal insights in new game forms that “fall outside the body of work we draw upon for analysis and study” (Pinchbeck 2010). If we provide meaningful insights for the game design field, we may overcome the limitations of the existing body of work by engaging in messier ‘real-world’ game-making contexts, like practising designers such as de Jongh (2017). WORLD4 suggests there is a reciprocal role for game design researchers in developing design artefacts and design methodologies that are rich with future possibilities.
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Appendix

Appendix A

This section links to a condensed version of data used in walker analysis study, Chapter 3. Data can be found online at: [http://bit.ly/MuscatPhDch3data](http://bit.ly/MuscatPhDch3data)


Data covers the following areas outlined in the framework:

1) Interaction Map: The interaction options and player choices during gameplay; 2) Interface Study: The onscreen information provided to the player; 3) Object Inventory: objects within the game world that may influence player interaction; 4) Gameplay Log: Noteworthy events that transpire over the course of gameplay; and concluding notes.
Appendix B

This section contains condensed published research of walker design themes discussed in Chapter 3, by Muscat et al. (2016).
First-Person Walkers: Understanding the Walker Experience through Four Design Themes

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ABSTRACT
The First-Person Walker genre is defined by minimal player interactions, a deliberate slow pacing of the game play, and ambiguous goals. These distinct characteristics of First-Person Walkers challenge how we may consider a digital game. As such, there is a gap in understanding the design attributes that contribute to the unique game experiences afforded by ‘Walkers’. We conduct a player experience study of four Walker games, Gone Home, Dear Esther, Proteus, and The Stanley Parable. From our analysis we discuss four distinct design themes specific to the Walker game experience: 1) player interaction, 2) temporal space, 3) player focus, and 4) ambiguity. We consider how each of these themes can be used to enhance the design of First-Person Walker player experiences.

Keywords
Game Design, Game Mechanics, Virtual Environments, First-Person Walker

INTRODUCTION
In this paper we discuss design themes derived from a player experience study of ‘First-Person Walker’ (Walker) games. The study consists of four recordings of Walker games that describe the players’ experience of the interactive elements, such as the way they navigate space and manipulate virtual game objects. We analyse four design themes from the study and discuss how they influence player interactions and perception to produce a distinct Walker game experience. Through our analysis we consider how Walkers foster ambiguous and contemplative digital game experiences through minimal interactions.

In a Walker game the player assumes control from the first-person perspective and steers in-game movements using directional inputs through a control interface, such as a keyboard and mouse. In these game worlds there is little in the way of obstructions, challenges or explicit goals. Traces of this simple, non-violent style of design can be found in a multitude of influential games such as First-Person Shooter (FPS) Half-Life 2 (Valve Corporation 2004). For example, in the initial stages of Half-Life 2 the player is given opportunities to
explore the game world without having to engage in combat, providing time to simply explore the game environment.

The Walker game *Dear Esther* (The ChineseRoom 2008) was modified from *Half-Life 2* and developed to test player interest of non-traditional gameplay. The game is stripped of all mechanics related to combative FPS, leaving just the game world and story (Pinchbeck 2008). In *Dear Esther* the player meanders through a bleak seaside landscape, listening to an angst-inducing and sometimes irrelevant location based monologue, finding man-made objects cryptically hidden within the environment’s natural geography. This approach to design has been described as an explicit attempt at mechanical minimalism (Keogh 2015) and can be found in multiple Walker games. For example, *Proteus* (Key, Kanaga 2013), *Gone Home* (Fullbright 2013), *TIMEFrame* (Random Seed Games 2015), *Everybody’s Gone to the Rapture* (The ChineseRoom 2015) and *The Stanley Parable* (Galactic Café 2013) each share similar, recognisable minimalist characteristics whereby players navigate through a virtual world, or simply walk through the environment.

![Screenshot, Dear Esther](image)

**Figure 1:** Screenshot, *Dear Esther*

The Walker, popularly referred to as ‘Walking Simulators’, has eluded established game definitions and there is no agreed-upon nomenclature. There is much debate surrounding their legitimacy as games, due to the minimal use of traditional FPS game mechanics. For this reason the First-Person Walker has infuriated some of the game playing audience, spurring discussion on its limited interactivity and established definitions of games (Gursoy 2011, 57). However this debate does not focus on the Walker game as a genre. While characteristics, commonalities and design patterns have been identified and discussed within the broader game design field, (notably by Walker game creators e.g. Gaynor (2014), Pinchbeck (2008)) we lack understanding as to what design elements and gameplay experiences are distinct to Walker games.

Whilst defining Walkers as a genre is challenging (similar to other emerging genres as discussed by Clarke, Lee, Clark (2015)), Walkers present to designers an array of potentially valuable alternate insights. These insight may help develop more passive, but nonetheless involved game experiences. For example, a player’s perception of the game world may be refocused to that of an investigator or close observer, via a strict adherence to minimal interactivity and slow, limited pacing. This style of gameplay provides a useful design perspective toward a definition of the Walker.
To understand these design themes we undertake a design-focused study that examines the player experience with a selection of four games identified as First-Person Walkers. Consalvo and Dutton’s framework for qualitative elemental analysis (2006) has been used to study four exemplary Walker games. Their specific, interactive design elements that produce and affect the player experience are highlighted and discussed.

METHODS

The methods used for our study include an analysis of player experience, connected to interactive design elements of four alternate First-Person Walker games. We are working with the Rules of Play game experience, defined as “1. The apprehension of an object, thought, or emotion through the senses or mind; 2. Active participation in events or activities, leading to knowledge or skill; 3. An event or series of events participated in or lived through” (Salen, Zimmerman 2003, ch.23, 2). Distinct, and even opposed, ways of playing and player experiences are all acknowledged as many layers that contribute to understanding the game experience.

The games selected for analysis are Dear Esther, Proteus, The Stanley Parable, and Gone Home. Each game shares common identifiable traits, notably their minimal interactions. Importantly, despite their core similarities, each varies in their technical and creative makeup, and their elemental composition. For example, the large winding landscape environments in Dear Esther is different to Gone Home’s more compact, house setting.

Aarseth’s multidimensional typology of games (Aarseth et al. 2003) and MDA (Hunicke et al. 2004) were considered as methods, but were deemed unsuitable for a detailed analysis of identifiable interaction elements connected to the player experience. In the end, Consalvo and Dutton’s (2006) qualitative methodological toolkit was adopted, as it provides a strong initial analytical framework for unpacking the abilities and limitations of designed, interactive components. As part of an analytical framework four major areas of interest for study are covered, with a primary focus on interactive game content visible to and engaged by the player. These are as follows: Interaction Map, Interface Study, Object Inventory, and Gameplay Log.

Interaction map: The choices that the player is offered primarily towards entities within the game world (Consalvo, Dutton 2006, 5). Interaction options, potential choices and points of interest are identified, helping ascertain how it may be played. By doing so the freedom by which the player is allowed to shape the game’s direction may be highlighted. For example how interaction options result in similar or different in-game outcomes during gameplay.

Interface study: The onscreen information provided to the player concerning character status e.g. the location of the character and action menus that give the player control over manipulating elements of gameplay (Consalvo & Dutton 2006, 4). An interface study examines how essential and non-essential information is privileged or made hard to find, and how choices are presented or withheld to the player.

Object Inventory: The objects within the game world that players may interact with, find, collect, create; be it to proceed, enhance their avatar, etc. (Consalvo & Dutton 2006, 3). This method may help ascertain the importance or role of objects, how they influence or encourage players to perform actions, and their value within the game.
Gameplay Log: The unexpected gameplay that can come into being, within the larger, encompassing game world or system, and the ‘intertextuality’ of elements. Emphasis is placed on emergent gameplay; what can happen to the player when they do something the game maker did not intend, the results, and more encompassing and influential aspects such as presentation. This helps ascertain how potentially ‘open’ the game is for players (Consalvo & Dutton 2006, 6) during play.

The data collected for analysis includes notes, logs, video and screenshots recorded during multiple play sessions of each of the four Walker games. The data was collated and formatted according to the needs of each section. For example, an object catalogue was created for each Object Inventory analysis, including tables listing in-world game objects, their appearance, location and function.

Through an analysis of collated notes, screen shots, and video detailing the interactive components connected to the player experience of each Walker game, four major areas of interest were highlighted as follows: Player Interactivity, Temporal Space, Player Focus, and Ambiguity.

PLAYER INTERACTIVITY

The Walkers discussed in this paper utilize a first-person perspective that provides a 3D view of the game world. In a Walker the player may steer through the game world predominantly using a computer keyboard and mouse to control the navigation and player viewpoint. These interactions enable the player to look and explore the game world, which are fundamental ‘core mechanics’ (Zimmerman, Salen 2003, 11) that define how the first-person games are played. These fundamental mechanics of First-Person Shooters (FPS) that enable players to observe and traverse the game world have been adapted for Walker games. For example, Walker games such as Dear Esther and The Stanley Parable offer players navigable worlds similar to FPS games like Half-Life 2. Whilst these games are similar, the Walker game does not involve combat style interaction. In FPS games the viewpoint serves as a method to aim a weapon. Similarly movement is used to outmanoeuvre, evade and attack targets. In Walkers these combat style interactions are not relevant to the game experience.

The possibilities for player interaction and gameplay are highly constrained in Walkers when compared to a FPS. For example, in each Walker game studied in this paper, the movement speed is fixed to a slow ‘walking’ pace which may be modified into a slower crawl (e.g. use of the ‘shift’ key in Proteus) but never a faster ‘running’ speed. This slow movement speed can make the traversal of large areas of game space feel laborious, requiring a player’s sustained input of the ‘W’ key to continuously move forwards. These keyboard controls are standard inputs for FPS games, although in Walkers these conventions are challenged.

The keyboard control conventions in FPS games are often responsive to enable agile movements. In Walkers the movement speed has a slow acceleration curve (i.e. build-up time to reach ‘maximum speed’ from a static position). Lateral movements often known as ‘strafing’ common to FPS games are present in Walkers but are less useful in a non-combative context. Jump inputs have been removed in each Walker preventing a player from vaulting over objects populating the environment or ‘bunny hopping’ (i.e. to continuously jump while in motion to gain momentum and speed). These modified controls alter the player experience so that the time spent in the game environment is extended.
Figure 2: Screenshot, *Proteus*. A calm and relaxing open island landscape that invites players to explore.

With fewer interactions to perform, the player has little else to focus on other than the audio-visual and virtual environment. These audio-visual elements within the game world are uncovered during observation and navigation. For example, player movement across the virtual environment in *Proteus, Dear Esther*, and *The Stanley Parable* activates location-based triggers. These triggers cause a change in game-state that often includes events such as environmental animations or audio to play e.g. the semi-randomized monologue in *Dear Esther* or the narrator’s dialogue in *The Stanley Parable*.

Both ‘use’ interactions and triggered events through movement introduce additional possibilities for players to interact and manipulate the game world. For example, in *Gone Home* and *The Stanley Parable* feature a ‘use’ or touch’ interaction, bound to the left-mouse button. This interaction is contextual, only working in conjunction with in-world environmental objects. In *Gone Home* players may manipulate objects according to their type e.g. small objects may be picked up, inspected up close, thrown or dropped, doors may be opened or shut, and lights switched on or off. In *The Stanley Parable* ‘use’ is less specific, players may only interact with few, specified objects within the game world e.g. large buttons and a computer keyboard.
The slow navigation controls, limited opportunities for player interaction and triggered events further enhance the audio-visual elements directing attention toward the game world as part of the player experience, rather than involving dexterous challenge or problem solving.

TEMPORAL SPACE
In relation to temporality in games Lindley states that “ludic systems are fundamentally time-based, and temporal structure is a major determinant of a player’s perception and experience of the ludic form” (Lindley 2005). In a digital game this temporal, or game time structure can be considered in terms of a number if distinct layers, which may be emphasized by the designer. For example, the four layers in a game include generative, simulated, performed, and discourse (Lindley 2005). Furthermore, Nitsche argues that digital games position players in a specific time and space, and that the experiences of both the temporal and spatial are closely interdependent (Nitsche 2007). This representation of time in the game world may differ from actual time whilst playing (e.g. day time and night time cycles may vary according player progress).

Walkers present an alternative approach to the temporal dimension of space in First-Person games, notably in regard to player actions and events experienced during gameplay. These actions and events are referred to as performance level temporal structures, the “parts of the virtual world directly experienced by the player” (Lindley 2005).

As discussed, the Walker experience involves few player interactions and slow movement within the virtual space. Furthermore, in Walkers there are few event-based disruptions, obstacles and pressures to impede the player’s movement and navigation. For example, in Dear Esther movement through the game world is slow and uninterrupted. There are little to no challenges, explicit goals, puzzles, effects or impediments to the player’s in-world status (e.g. health and damage) or their navigation. Although the slowing of movement, uninterrupted navigation and extending of time could be seen as a subject of frustration for some players, it does much to configure the played Walker game experience.

Without obstructions the player may set the pace of navigation as they please, allowing for extended time spent within the game world. Without gameplay pressures the ‘action’ of
gameplay could be said to be reduced or ‘dulled’. Because of this passage of time experienced can be said to feel extended. By extending time spent within the game world the player may gradually ‘soak in’ and indulge in their environmental surroundings and the audio-visual experience.

For example, Dear Esther and Proteus prolong player movement through their outdoor game-worlds, placing emphasis on the aesthetic beauty of the landscape. Gone Home and The Stanley Parable condense details within a more confined, labyrinthine, indoor environment that asks the player to stop or slow down, to find points of inquiry within clutter and close detail. Slowing down player actions intensifies the audio-visual experience as a point of interest, particularly towards the 3D game world.

Because of the slow, effortless movement and unobstructed navigation, the player becomes an uninterrupted observer of the game world; that may be better recognised as a setting than a playfield or sandbox.

![Figure 4: Screenshot, Gone Home. Samantha’s bedroom filled with cluttered environmental details to be examined](image)

Additional player interactions specific to each sampled Walker game exemplify this notable design theme. In Proteus the standard ‘jump’ key (space on the keyboard) has been replaced as a ‘sit’ command; an option for players to adopt a stationary position for ‘relaxing’ to simply take in the sights and sounds of the environment, and watch time lapse from day to night. Gone Home uses a ‘crouch’ command bound the ‘C’ key to lower the player’s height and view; the player may inspect details hidden under furniture or under tables up close, otherwise out of sight or reach if they were standing. In Dear Esther the player may ‘zoom’ their vision using the right mouse button, to see details from far away, or up close when nearby.

Although these are not major player interactions, their implementation similarly slows the player down, reducing pace to highlight the virtual environment. While the player may use the environmental terrain to manipulate their movement speed e.g. falling down steep inclines to quickly circumnavigate or skip part of the designated path in Dear Esther, or quickly unlocking doors in Gone Home, they are never rewarded. There is no optimal way of playing, although gradual navigation and observation are encouraged, and arguably enforced through the limitations of the interactions.
The slowed pacing of the temporal game experience and emphasis on the game world encourage players to consider the virtual environment as something to be ‘overcome’, but as a subject of interest in itself and enjoyed as a subject of care-free, sustained inquiry and thought.

**PLAYER FOCUS**

By reducing player interactions, slowing the game pace and removing obstructions, the Walker applies focus predominantly towards the audio-visual element, notably the game world and its contents. To improve player focus towards the game environment common game design techniques have been used.

In the Walker games the user interface (UI) is empty, unlike First-Person Shooters, that display critical information such as character status and items held onscreen. The player’s vision of the game world in a Walker contains little to no user interface elements onscreen, although *Gone Home* as an exception, using a small ‘crosshair’ in the centre of the screen (an element for aiming common to the FPS). In *Gone Home*, when the crosshair is placed over specific intractable environmental objects e.g. doors, a written and contextual description appears onscreen, denoting that the object can be ‘used’. Nonetheless *Gone Home* very much like *Dear Esther*, employs a sparse UI with minimal distractions to obstruct the player’s view of the game world, or direct their movement and actions.

![Figure 5: Screenshot, Half-Life 2. Note the user interface HEALTH and AMMO readouts](image)

As there is very little in the way of challenge-based ‘tasks’ for the player to overcome (e.g. Problem solving and strategizing, contest, and mastery) there is very little information that necessitates visual representation within the user interface. Furthermore, player actions that could be quantified and visually represented (e.g. environmental objects seen and steps taken) are not. On-screen information, much like the core interactions, have been reduced.

Within the game world, the player’s viewpoint does not have visual depiction of a virtual body. The viewpoint is suspended at head-height, underneath is entirely transparent. Looking down in-game reveals no torso or limbs, only the environment and perhaps a drop shadow. Historically First-Person Shooters have a similar characteristic, having often avoided the technical complications in representing the player’s virtual body from the first-person perspective.
In a FPS the player’s attention is divided between multiple sources of information on-screen. This may include in-world cosmetic details, items to collect, entities like non-playable characters, onscreen elements like their character’s status, objectives, prompts and tasks to complete. Navigation of the game world itself also comes with risk. For an FPS player to focus entirely on the virtual environment is to ignore vital elements. While a Shooter player must negotiate multiple points of focus, the Walker player has only a few.

The absence of UI information and a visually depicted body minimises on-screen distractions and potential interference with the audio and on-screen visual elements. This, and the reduction of interactions and slower game pace, serve to tune player focus more thoughtfully towards dominant game elements present; notably, the game world and its contents, whose details are often found only through close visual scrutiny.

For example, environmental details that provide narrative information in *Gone Home* and *Dear Esther* are often small objects, nestled within clutter, or in corners of the virtual environment. In *The Stanley Parable* potential game endings may be uncovered through interaction with less-obvious but specific environmental objects. In *Proteus* the animated time rings that advance game world time from season to season can only be found at specific times and locations during day and night cycles, within the virtual environment. The player may not only act as an observer but as a surveyor, who seeks out details as a major source of interest and motivation.

By turning the player’s focus towards the game world and its contents over time, less obvious in-world elements may become more pronounced, noticeable, or perhaps take on greater significance. In *Proteus*, as players wander through a visually abstract island environment, changes in environmental details become more apparent according to seasonal, and weather changes (e.g. trees changing colour or losing leaves, animal migration and so on).

![Figure 6: Screenshot, Dear Esther. Game world objects as environmental details. Car accident photographs and candles within a cave, arranged as a memorial.](image)

In *Gone Home* and *Dear Esther*, environmental details that are more pronounced (e.g. photos, written notes etc.) or mundane (e.g. hair dye bottles, car parts etc.) may take on a narrative significance during navigation and observation. Players may draw connections between these and audible monologues or diary entries. By considering the relationship between these elements the player, through inquisitive thought and action, may build a
more conclusive picture in understanding the various dimensions of the game’s world and story.

The sparse user interface and lack of on-screen information has players direct their focus towards the game world, and its contents. By reducing obstructions and emphasizing environmental details, the player’s Walker experience becomes more of an investigative and contemplative one; which has players consider their surroundings in a more intriguing, speculative and subjective manner.

**AMBIGUITY**

In the absence of complex player interactions, challenges and explicit goals, Walker games extend in-world game time and prioritize the game world as a major source of focus. By doing this the Walker seeks to develop a sense of intrigue to sustain the player’s attention, and motivate interaction. To develop and tantalize a sense of discovery, ambiguity is used as a primary driving force. Ambiguity is defined by Gaver et al. (2003, 235) as a “property of the interpretative relationship between people and artefacts”.

Gaver et al. argues that while ambiguity is often considered “anathema in Human Computer Interaction” it is a resource for design “that can be used to encourage close personal engagement with systems” (2003, 233). Drawing upon contemporary arts and design practice three classes of ambiguity are outlined as follows: Information, context, and relationship.

Ambiguity of information arises in the way information is presented, and how it may frame or influence our reaction and response. This asks us to “project our expectations into an interpretation of incomplete information” (Gaver et al. 2003, 237).

Ambiguity of context arises “not because things are unclear” but “because they may be understood in different context, each suggest different meanings” (Gaver et al. 2003, 236). Duchamp’s Dadaist piece, *Foundation* (1917) is cited as an exemplary example. This requires an “integration of seemingly incompatible frames of reference” (Gaver et al. 2003, 237).

Ambiguity of relationship “arises from the viewer’s personal relationship with the piece” (Gaver et al. 2003, 237). These produce a sort of self-examination, pushing us to imagine how we might personally engage and what would be the consequence. We form ‘intellectual, aesthetic, emotional, and moral judgements’ as a result of this speculation, which “evokes a projection of our subjective experiences and attitudes onto new situations” (Gaver et al. 2003, 237).

The three classes of ambiguity identified feature prominently within each of the four Walker games, as discussed below:

**Ambiguity of Information**

Each Walker begins with an initial, preliminary question; *In Dear Esther and Proteus* the player’s avatar’s role is abstract and undefined. *Gone Home* begins with a mysterious message as to the location of a missing character, Samantha. *The Stanley Parable* asks where Stanley’s co-workers are and what is the true nature of the world he inhabits? Conclusions are obfuscated throughout their game worlds and audio-visual elements. Points of interest within the game world are often sources information that may provide potential answers.
Points of interest are typically contained within the virtual environment. For example: Environmental objects, visual effects and triggered audio are potential sources of information, often concealed and fragmented throughout the game world. *Gone Home* layers information through its domestic clutter, *Dear Esther* scatters vague fragments across its vast outdoor environments, *The Stanley Parable* alludes to divergent paths and possible outcomes through audible and visual suggestion, and *Proteus*’ painterly game world is in a constant state of change in its shifting weather and seasons.

*Figure 7:* Screenshot, *The Stanley Parable.* The first explicitly telegraphed junction point exhibits ambiguity of information. At this moment the narrated voice-over states “Stanley walker through the left door” however the player may navigate left or right.

Because of the lack of explicit goals, user interface information, slow movement, and perceptual limitations of the first-person perspective, player focus is not only drawn towards what can be seen, but also the unseen, off-screen and out of sight. Concealment and fragmentation suggests the presence of hidden information, which tantalises the prospect of insight and motivates navigation, and leads to a questioning of the game world during exploration.

**Ambiguity of context**

Although their game worlds can be navigated with ease, the fragmentation of information within Walkers complicates and problematizes how they may be coherently interpreted in relation to one and other.

Each Walker balances obfuscation and clear communication of in-world content using audio-visual elements and game level design techniques. The separation and concealment of points of interest and information are enacted through numerous occlusion techniques. For example, spatial segmentation, zoning, and narrowing, widening, framing and various level design elements (e.g. 3D models, geometry, and lighting) do much to entice and misdirect player perception and navigation.
Figure 8: Screenshot, Gone Home. A red hair dye bottle in the upstairs bathroom, used by Samantha. Note from the doorway the bottle is obscured however the dye splatter is visible; the player is initially misdirected to assume the splatter is blood.

Obfuscation reframes navigation as a process of discovery and allows the player to develop a sense of autonomy through suggestion when uncovering in-world details. As the player spends time exploring the game world they develop a more attuned literacy in identifying and understanding these elements and their in-world context. The significance of in-world content in Walker games is often vague and less clearly defined than challenge-based games such as Half-Life 2, where content is often imbued with a quantifiable significance (e.g. health and ammo pick-ups). For example, objects that make up the environmental clutter in Gone Home may be understood differently in retrospect once the player has obtained more crucial contextual information (see Figure 8).

Ambiguity of relationship

Gone Home has us examine a relatable domestic setting that draws parallels to our own nostalgia and family memories. By allowing deviant actions The Stanley Parable asks us to question why we find game and narrative conventions so compelling.

As mentioned, discovering and interpreting the fragmented points of interest and content, throughout the game world, are key to how the player may develop an understanding towards the overarching questions posed. The restrictive nature of the first-person view and control, and vague in-world game elements problematizes how easily or efficiently the player may interpret and conclude as to the relationship game elements. With no method for recording findings in-game (Gone Home’s plot-relevant diary entries the exception), players must mentally store information found, or record notes.

The time spent slowly navigating through the game world becomes time for contemplative thought and speculation to the relevance of audio-visual elements. Each new point of focus serves as pieces of additional information that may be added to the player’s mental map. In their totality the player may build a more conclusive or comprehensive picture as to their relationship and significance within the greater narrative context.
Although guided by the distribution of information through environmental, audio-visual and interactive elements; this process of observation, interpretation, and thought is not explicitly directed, demanded, or expected from the player. The questions surrounding the game world are not quantifiable problems to be solved, but more nebulous, requiring players to internalize links between elements to make full sense of the game world.

This ambiguity of relationship creates gaps between game content. These gaps provide space for interpretative, subjective connections within the player imagination, providing a negative space that encourages deeper thought towards narrative and overarching themes.

**CONCLUSION**

Walker games minimize interactions, using interactive conventions from established genres such as the First-Person Shooter; adjusting and re-implementing them for non-combative purposes. As the Walker is not bound by explicit rules, challenges, and tasks to direct interactions and player activity, the prominence of typical game elements is altered. By minimizing interactions to a core few, limiting movement speed into a slow pace, and removing almost all user interface elements; the player’s attention is implicitly directed away from interaction elements, towards the audio-visual. These audio-visual elements, particularly those visible within the game world, become more pronounced as points of interest and focus. These overarching characteristics frame the player’s game experience as something not to be overcome, but of keen perception and close inquiry.

Ambiguity is key to building interest and intrigue, playing upon the limitations of the first-person perspective. With no in-game method for recording findings the player must rely on their own mental recollection or written notes; subjective, interpretive thought is encouraged as part of the process of exploration and discovery. Slow movement during player interactions and fragmented environmental details encourage players to fill in the gaps with subjective, imaginative thought, and contemplate more deeply towards their relationship.
It is clear the theme of ambiguity may yield further insights into the First-Person Walker beyond interactive elements. Future investigation will expand on our findings and consider how ambiguity permeates within other areas of design within the Walker. This may involve an interrogation of spatial and environmental design elements due to their prominence in Walker design, and draw upon spatially-relevant theories and texts such as Epic spatialities: the production of space in Final Fantasy games (Huber 2009) and Video Game Spaces: Image, Play, and Structure in 3D Worlds (Nitsche 2008). This may shed further light as to how designers may facilitate intrigue and discovery in exploring virtual environments.

We have found that interaction within First-Person Walkers is not so much navigation within the game world, but an investigation motivated by intrigue and speculation. This may indicate that Walkers are indeed separate to common forms of digital games, although they do provide insight as to the digital game design; how scarcity of interaction may draw a player into audio-visual elements and tantalize imagination, and deeper, more considered thought.

**BIBLIOGRAPHY**


Random Seed Games. TIMEframe. PC, Mac. 2015


Appendix C

This section contains condensed published research of the \textit{WORLD4} design themes and strategies discussed in Chapter 6, by Muscat and Duckworth (2018).
WORLD4: Designing Ambiguity for First-Person Exploration Games

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ABSTRACT
In this paper we present the design and evaluation of a first-person digital game WORLD4 inspired by the walker, a genre of 3D games. Walkers typically include minimal player interaction, slow paced game play, and ambiguous exploratory worlds. Walking is the primary means of player interaction, rather than prioritize ‘skill-based’ mechanics. However, their design traits are not well understood and challenges many accepted game design conventions. We have designed WORLD4, a multi-dimensional first-person exploration game that utilizes walker design traits to explore how ambiguity might support spatial-exploratory game play experiences. 14 participants playtested WORLD4 and analysis of the data identified three descriptive themes specific to the walker game player experience: 1) designing partial inscrutability; 2) shifting meaning; and 3) facilitating subversion of expectations. We use these themes to describe six prescriptive design strategies that may assist designers in designing for ambiguity in first-person exploration games and exploratory game environments.

CCS CONCEPTS
• Applied computing → Computers in other domains
→ Personal computers and PC applications
→ Computer games

Author Keywords
Game design; level design; game environments; walking simulator; walker; navigation; exploration; ambiguity.

INTRODUCTION
This research discusses WORLD4, a multi-dimensional first-person exploration game designed to explore the design traits of the ‘walking simulator’, most notably, the trait of ambiguity. Our study builds upon prior research into the design traits of the ‘walker’ [24]; a burgeoning game genre not formally defined, that has presented unique challenges to the field of game design, and how we may consider the design of spatial-exploratory game experiences. The walker was popularized in the 2012 – 2013 period by critically acclaimed titles such as Dear Esther, Gone Home, The Stanley Parable, and Proteus [31, 9, 10, 7] (see Independent Games Festival 2012; 2013; 2014 [14]). These four titles share similarities including: reduced conventional first-person movement game play mechanics; solitary exploration of atmospheric fully 3D mapped spaces; and an evocative environmental game world, which is in itself a principal game characteristic. We consider these four games as key titles that define the walker genre.

In Dear Esther the player meanders through a bleak seaside landscape, listening to a voiceover monologue, and discover objects cryptically hidden within the natural geography of an uninhabited and windswept Hebridean island. Players’ focus is one of navigation and environmental atmosphere, accompanied by a sweeping orchestral score. In Gone Home players explore a large, empty family home, rummaging through detailed 3D household objects, letters and notes; consisting of an interconnected network of domestic rooms and halls, explored to unravel a mystery. In The Stanley Parable players explore cryptic empty office spaces, narrated by an omnipresent disembodied narrator, and unravel a series of spatial and narrative vignettes. In Proteus players freely roam and explore an imaginary procedurally generated island, characterized by pixeled and painterly 3D visuals and its generative audio that responds to player movements.

These walker games explicitly feature minimal use of game mechanics as compared to other first-person game genres [17]. The mechanics of game play are typically reduced, slow, and non-violent. Walking is the primary means of interaction, and popular game design conventions such as challenges, puzzles, fail-states, and goal-based structures are diminished or absent. The walker eludes traditional game classification, presenting atypical approaches to what is conventionally considered a designed game, evident in popular controversy towards walker titles such as Dear Esther as discussed by Gunson [12]. Yet many players find their exploration and experiences and environments to be compelling. The walker presents a re-prioritization of established game conventions for alternative experiences, described as exploratory, interpretive, and self-reflective by Cross [4] and Sicart [29]. By reducing and removing game design elements considered essential, assumptions are
challenged as to what designed games must contain [5]. As such there is limited critical design understanding towards the walker within the game design field, evident within foundational game design literature and theories.

Game design literature places much focus and emphasis on rule-based design, prioritization of mechanistic complexity, and quantified outcomes, see Salen & Zimmerman [27]; Schell [28]; Koster [18]. However, their design approaches do little to explain the characteristics or experiences of the walker within a game design context. As such the walker has been largely ostracized from design discussions, like other emerging game genres that fall outside of major discussions as argued by Polansky [26]. Limited critical design discussion reveals a gap within the field of game design knowledge, which indicates potential value in exploring the walker.

In Muscat et al.’s prior qualitative analysis of walker games four shared walker design traits were identified: 1) Player Interaction; 2) Temporal Space; 3) Player Focus; and 4) Ambiguity [24]. These reveal two noteworthy experiences as manifesting during walker game play exploration: uncertainty [3], and curiosity [21]. Using Lowenstein’s definition of curiosity an information gap arises in our awareness of what we know and what we want to know [21], identified within digital games in curiosity-focused digital game research [32]. Walkers however differ to other game genres; they may be revealed and exposed through spatial exploration but often remain unresolved and inconclusive. They cannot be mastered or ‘gamed’ like a challenge-focused or goal-directed game, yet we still wish to understand them, a characteristic that closely aligns with their trait of ambiguity.

Based upon game and level design techniques identified in walkers by Muscat et al. [24], we further interrogate walker design attributes, most notably ambiguity, to design the spatially ambiguous, walker-inspired game WORLD4, and through play testing understand the resulting player experience. In the following sections we discuss the underlying theory and design decisions within WORLD4’s development, our player study methodology, and descriptive observations. Our insights provide the basis for six prescriptive design strategies for game designers in developing spatially ambiguous first-person, exploration games. In doing so we seek to further understand ambiguity within game design.

WORLD4 – INTERACTIVE EXPLORATION GAME

WORLD4’s design was motivated by the four walker design traits [24] and created in the 3D game engine Unity. We prioritized ambiguity in our design which Gover et al. describes as “a property of the interpretative relationship between people and artefacts” [11], and manifests as three types of designed ambiguity: information, context and relationship. Ambiguity is in itself a complex topic of discussion. For example, in The Ambiguity of Play [30] Sutton-Smith notes play is in itself ambiguous, and sources of ambiguity in play are manifold, drawing upon Empson’s literary analysis Seven Types of Ambiguity [8]. We acknowledge this broader complexity but constrain our focus to more design-specific theory.

When conceptualizing our design, we decided to exclude prominent walker characteristics e.g. written narrative and voiceover acting [24]. This resulted in a significant divergence from existing walker games referenced. The design of WORLD4 prioritizes navigation and an exaggeration of the ‘looking’ mechanic, a key difference to existing walkers. In WORLD4 players explore a mysterious and interconnected game world fragmented across four simultaneous first-person perspectives (see fig 1). Each perspective is comprised of four viewpoints on a single screen and provides a partial view of the 3D world. Players navigate through a series of visually abstract corridors and chambers. While negotiating visual and spatial differences between the four viewpoints players reveal unusual hidden geometric sights.

![Figure 1 ©Alexander Muscat: Screenshot, WORLD4. Image key 1-4 are individual viewpoints that display alternate 3D views of the same environment.](image)

WORLD4’s overall design intended to enhance ambiguity by reducing explicit guidance, concealing and withholding the explorable parts of the environment. As part of the ambiguous experience we considered the emotions of curiosity, drawing upon To et al. [32], and uncertainty, discussed at length by Costikyan [3], as possible experiential effects of playing WORLD4.

Over an 11-week period we made multiple experiments including onscreen views i.e. viewpoints displayed on multiple-montors, multiple views that player can toggle between, and a ‘mosaic’ version that merged all viewpoints as one sub-divided view. These were discarded in favor of the current design (fig 1) following informal testing. Other versions significantly disrupted navigation of explorable 3D space, impeding exploration. We had challenges in designing an environment both suited to the four-viewports and interesting to navigate. To support our design, we drew inspiration from an amalgamation of game level design techniques from existing walkers [31, 9, 10, 7]. To enhance ambiguity, we experimented with visual and spatial techniques different to existing walkers, such as reducing depth cues to disrupt spatial information readings.
Session: Paper Presentation

In the following sections we will discuss how each walker trait [24] informed design decisions. We highlight specific considerations in WORLD4 including theories and methods from the field of game design and broader design research.

**Player Interaction - Multi-Viewport First-Person View**

Player Interaction describes reduced interactions, in-game pressures and explicit 'challenges' in walker games [24].

Like the four walkers previously discussed, WORLD utilizes only a first-person perspective and navigational movements controlled using a keyboard and mouse. WORLD differs; the player’s first-person view is made up of four simultaneously rendered camera outputs to four onscreen viewports, divided across the monitor’s display. Each viewport displays one of four individual in-game cameras attached to the 'player controller' that determines player-character interactions. Each camera is fixed to the exact same location and orientation on the controller and captures a similar first-person perspective. A camera controller uses a custom script utilizing Unity’s multi-screen display output feature, rendering all four cameras simultaneously as a divided onscreen 'quad view'.

Each camera renders specific environmental elements per viewpoint according to a set of culling mask properties per camera; allowing the inclusion or omission of objects rendered by the camera. What environment elements are displayed per a viewport corresponds to an assigned 'layer'; there are a total of nine layers that elements may be assigned to. The layers make up the underlying logic of WORLD4 in determining which camera environmental elements are rendered by, therefore which viewport they are displayed in. Consequently, what can be seen in each viewport is variable and may not be visible in another or may appear different. We describe multiple views and movement controls as a core game mechanics [27].

**Temporal Space - Layered Explorable Environment**

Temporal Space describes reduced in-game temporality with slower navigation speeds and an emphasis on environmental details. Reduced spatial temporality in walkers was identified as reframing the game space as a subject of aesthetic pleasure and exploratory enquiry [24].

In WORLD4 the viewport technique adds versatility in how the game’s 3D environmental geometry could be designed, as entire parts of the environment may be concealed or obfuscated across simultaneous views. Visual occlusion techniques, notably false walls (e.g. walls that can be passed through), were a core visual occlusion technique used in the design. Mixed across viewports false walls are concealed or visibly open. Players may notice false walls fragmented across viewports while spotting the difference, or simply stumble through. This increases concealment of the environment through visual occlusion and reduces navigation flow as visual and physical characteristics are made variable.

The level design in WORLD4 was inspired by walkers whose layouts shared similarities to mazes and labyrinths that structure and occlude the explorable game space [34]. Techniques include extended corridors for navigational ‘arrivals’ defined by level design theorist Totten [33] as the use of geometrical sight lines to ‘frame’ a horizon and create a dramatic buildup and anticipation in arriving at a destination. Blind corners were adapted from maze design, which use harsh 90-degree angles that conceal the horizon by occluding the destination for sudden reveal.

![Figure 3](Alexander Munsat: Image Key – 1 – 3) False walls in the environment; 4) An opening revealing a room beyond; 5) A false wall. Dotted lines added to identify wall contours.)

In WORLD4 the game environment is structured as a level ‘hub’, an interconnected series of branching and recurring chambers and pathways. The hub is a “prospect space” [33] allowing players to survey elements from one location and notice openings through return visits. There are physical obstructions i.e. logic gates, but rather visual occlusion techniques create a form of ‘perceptual gating’ (e.g. false walls) by which players must first notice concealed pathways and openings. Through returning to the hub location player awareness of perceptual gates may increase. However, unlike
some existing walkers there is no final ‘end’ location. Instead, emphasis is placed on the ongoing exploration of the space to engage players.

**Player Focus - Disruptive Visuals**

Player Focus describes the removal of onscreen user interface information and in-game visual occlusion to heighten the audio-visual as a point of inquiry, notably the 3D game space, and use of environmental details as a source of intrigue and perceptual curiosity [24]. WORLD4 seeks to draw player attention towards the world as a source of interest during exploration by disrupting clear readings of the space. We used various techniques to configure the space as perceptually elusive, intended to frame the environment as something to be scrutinized and investigated for the purposes of navigation. One such technique included the manipulation of depth cues through blending and contrasting materials, designed throughout WORLD4’s environment to enhance concealment. Surface materials used a combination of standard and flat shading effects to diffuse lighting and blend surface geometry, removing the visible contours and edges. Players may perceive the environment as two-dimensional when this shading technique is used. 3D depth is essentially ‘flattened’, requiring the player to move and adjust their viewing angle to perceive distance and the contours of 3D objects and level geometry.

![Image](image.png)

**Figure 4** © Alexander Muscat: Image Key: 1) A vertical drop in the corridor, difficult to perceive due to flat shading; 2) A walled corridor wall leading to a vanishing point; 3) A moving red sphere travelling down the corridor. Dotted lines added for clarification.

Because of potential player disorientation, environmental contrast was used e.g. reference points and 3D object landmarks [33]. Spatialized audio was used to guide navigation through proximity-based sounds and direct players towards occluded points of interest. In addition, a shifting ambient soundscape was activated based on player position to denote location changes during navigation.

1 Proximity-based sounds in WORLD4 were created using a combination of license-free audio recordings, and free software BFXR and Audacity.

**Desired Ambiguity - Evocative Environmental Artefacts**

Desired ambiguity draws upon Gaver et al.’s description [11] which we use to describe the obfuscation of the game space, and environmental elements that cannot be clearly ‘solved’ or understood [24]. In walker games ambiguity manifests as three types: information – questions towards the game world and the suggestion of hidden information; context – elements whose meaning changes as environmental context is revealed; and relationship – the interpretive gap between elements that may be subjectively filled. Ambiguity was identified as transforming the walker environment into a more subjective one that has no singular or clear meaning and cannot be solved through exploration.

In WORLD4 we have designed four connected environments stylized to feature different, distinct characteristics. For example, the central hub area is loosely stylized as a shopping mall atrium but warped and abstracted in its spatial architecture (see fig 1). Locations are separated in a way we can describe as ‘districts’, derived from Lynch’s *The Image of the City* [22]; sections where the observer enters and notices an identifying characteristic different to the last. In WORLD4 spatial thresholds mark a linear, distinct transition between areas that contain different spatial and stylistic juxtaposition. These aim to compel comparison and evoke a response as players move through a series of increasingly abstract spaces.

Objects, within the environment act as ambiguous points of interest for exploration. These are abstract primitive 3D shapes that do not convey explicit narrative information but are stylized to evoke a response through repeated encounters. Their design follows Totten’s guidelines for applying symbols in game levels: 1) these must have a unique appearance; 2) are repeated so that players identify through repetition [33]. This technique intended to foster an ambiguity of relationship as players may develop interpretative associations between objects.

**PLAYER STUDY AND DATA ANALYSIS**

To investigate the player experience of WORLD4 we undertook a two-stage qualitative study with 14 participants. This consisted of two observational playtest approaches adapted from grounded theory methods outlined by Charmaz [2] and LeCompte & Schensul [20] we deemed appropriate, for this emerging area of game design. We briefed participants about the study and WORLD4’s controls, but not about the nature of the game. Participants were free to play WORLD4 for as long as they desired in a single setting and could stop playing at any time. Participants were asked about their familiarity with walker games; all expressed having existing knowledge.

Stage 1 consisted of a qualitative evaluation of 7 participants game experiences, recruited locally on the university campus through an open invitation. Stage 1 included recorded observation of players in a controlled environment [20] of onscreen game play using screen and microphone capture
software to record each session. During each session specific participant actions, behaviors, and comments were noted. Following the participants game play session, a qualitative conversational interview was conducted [2]. Participants answered questions regarding their experience, feelings, and impressions after the game play session.

Stage 2 consisted of remote game play recordings of 7 participants experiences. Participants were recruited online through an open invitation on social media platform Twitter, not targeting a specific demographic or restricted by gender or age. The approach was inspired by at-home remote playtesting methods constructed by indie game developers de Jongh [16] and Daviav and Leaceok [6], which accommodate a more naturalistic in-home context as part of the game experience. Participants were asked to voice their thoughts while playing, derived from the open-ended, conversational, “thinking aloud” prompts [2]. Data was collected via participants sending recorded files to the researcher once complete. Following the game play session participants answered an open-ended questionnaire to discuss their game experience, feelings and impressions [2].

Our observations of participant play sessions focused on in-game spatial-exploratory behaviors, and comments towards the environment. Average participant play-time was 30 minutes, exceeding our expectations (20 mins). Through observation we learned 13 of 14 participants were engaged with exploring the game and often commented towards the ambiguous elements of the environment. We observed similarities in participant game experience across all sessions. These included comparison of differences across viewports, memorization of recurring 3D objects, further investigation of environmental elements, overlooking or missing locations and objects, and returning to elements previously discovered.

On conclusion of the study, each session recording was reviewed in full and partially transcribed. Initial written observations and notes were added following guidelines [20]. We used Daviav and Leaceok’s categorial spreadsheet approach on the observational data captured and note formatting for clarity [6]. Data analysis utilized a qualitative open-coding process adopted from grounded theory to construct themes [2]. Our coding focus was towards participant actions, activities, and comments that highlighted exploratory in-game behaviors or environment characteristics. We conducted a pass of each sessions recorded data individually, and identified general keywords tagged to comments and observations. For example, ‘finding boundaries’ and ‘surface and object collision’ for player circumnavigation of rooms to locate boundaries and openings. Keywords were subject to a coding pass resulting in 90 codes.

Relationships between codes were visualized through a whiteboard affinity mapping process. Codes were placed as sticky notes on a whiteboard, and gradually clustered by likeness to identify significant patterns and map affinities agreed upon by the researchers. Affinities highlighted reliable, shared traits between codes. For example, navigation wayfinding, interpretation of 3D objects, and investigation of locations were identified. More independent codes were clustered between groupings with shared likeness, and their relatability and divergences were discussed. A more general thematic relationship was agreed upon across code groupings, forming seven dominant categorical code groups describing an overall participant experience. Through further scrutinization of categorical codes we identified three dominant overarching themes that affected player experience derived from WORLDT4.

**THEMES DESCRIBING PLAYER EXPERIENCE**

Overall, participants were engaged in playing WORLDT4 which was frequently described as a novel exploratory experience. Participant 11 commented that WORLDT4 “feels like a puzzle to be explored, not solved”. We will discuss the results of the study and player experience further by articulating three overarching themes: 1) Designing Partial Inscutability; 2) Shifting Mapping; and 3) Facilitating Subversion of Expectations.

**Theme 1: The Design of Partial Inscutability**

This theme describes how participants found WORLDT4 to be inscrutable during game play exploration. Inscutability can be defined as an inability to be scrutinized, difficulty in understanding and interpreting, and being mysterious. All 14 participants commented on WORLDT4 as difficult to understand, interpret, and mysterious, suggesting the game experience is an inscrutable one. Inscutability emerged as a major experiential factor in three category codes in designing for: 1) partial inscrutability; 2) variable disorientation; and 3) inscrutability as misinformation.

**Designing for Partial Inscutability**

Of the 14 total participants, 15 expressed an interest and engagement in negotiating and resolving the unclear nature of WORLDT4’s environment. P7 described enjoyment in trying to perceive and rationalize the environment; “I quite like the element of having to figure out what it is.” Much of this was through their interaction with partially inscrutable elements; elements that raise a question as to how they might be approached and negotiated to reveal the extent of their characteristics. Elements include false walls and concealed exit forms that are initially unclear and cannot be scrutinized at first; hence we use the term ‘partially inscrutable’. These were observed to compel participants to adjust in-game actions understand and resolve unclear and unusual visual and spatial characteristics. All 14 participants performed movement changes in response to inscrutable elements. These included moving closely along wall edges, tracing the contours of the environmental geometry, lateral movements to circle an object and view it from all sides, and physical collisions with objects and surfaces. Such movements allowed participants to shift their viewing angles to expose the 3D properties of the element in question. P3 described their actions as investigating “what works and what doesn’t, not necessarily breaks, but what are my boundaries”.
Session: Paper Presentation

Results suggest partial inscrutability supports navigation and guidance by drawing attention towards itself, paradoxically, by conveying explicitly unclear information that can only be understood once adjusted to. Partial inscrutability when initially viewed communicates an explicit information gap by obscuring visual and spatial dimensions of the game environment. Participant responses reveal a type of perceptual curiosity (see To et al. [32]) as participants were drawn toward the novel visuals of inscrutable elements to investigate. For 13 participants the process of identifying and resolving partial inscrutability was appealing, and we observed a heightening of spatial awareness towards the game environment.

Designing for Variable Disorientation

All 14 participants encountered elements that disoriented their navigation and visual perception of the environment. We observed that disorientation compelled both positive and negative effects depending on participant interest and tolerance. This included removal of depth cues and application of onscreen visual noise. All participants expressed reactions towards disorientating elements that included “confusing”, “unsettling”, “disturbing” and “disorientating”. While this suggests a negative response in frustration in navigation and tolerance of such elements, 13 of 14 participants were interested in negotiating disorientation. Responses observed suggest a link between discomfort and appeal in disorientation, through a desire to overcome or negotiate the effect, and investigate what was concealed or how the effect was achieved. For example, P9 compared the sensation of disorientation to their past experiences: “My sense of perception really feels lost ... Years ago, I rapidly volunteered to be hypnotized, and that feeling you get when you’re hypnotized is about losing awareness of everything around you, and that disorientation is very similar to the disorientation I am feeling around here."

Our results suggest that despite negative responses, there is an appeal in being disoriented during exploratory navigation. Despite expressed frustration, participants largely accepted disorientation as part of an overall unsettling and unfamiliar experience. This appealing aspect of the game mirrors Caillou’s Illusia; games of disorientation that “momentarily destroy the stability of perception”, “provoke vertigo” and provide perceptual disturbances “commonly sought for their own sake” [1]. In much level design theory disorientation is rarely discussed. For example, game level designers consider disorientation as a perceptual disadvantage and potential frustration, creating “a negative gameplay experience” [33] only appropriate for scaring the player [19]. This suggests that despite the negative effects of visual and spatial disorientation in WORLD4, participants broadly found this aspect appealing.

Designing for Inscrutability as Misinformation

Participants were observed attempting to understand and resolve environmental elements that had no resolution. 8 of 14 participants interacted with and commented on such elements. P12 described their WORLD4 experience as “intrigued and willing to decipher the world... maybe I failed to do that”. All participants questioned their understanding of locations previously discovered. 8 returned to prior locations to investigate further; P9 described this activity as improving their “mental map”. In revisiting locations, 5 of 14 participants revealed hidden and unintended glitches in the environment. For example, P9 investigated a dark blue seam glitch in 3D level geometry. This was also noticed by P14: “Wow! I thought I just saw a glimmer of something dark blue? Right there. It doesn’t appear I can go left into this blue space. It’s visible right there, so I wonder if there’s something in that direction”. This suggests that unintended glitch served as misinformation. Participants perceived it to be significant and expressed uncertainty as to how to understand or reveal it during investigation. However not all participants responded with interest to this misinformation. P11 found a lack of clear insight and feedback frustrating “I feel like I am stuck now. I feel like I’ve done something wrong because I can’t make anything change.”

Misinformation appeared indistinguishable to elements that could be understood or resolved, indicating a blurred distinction between those perceived as intentionally and unintentionally negotiable and “solvable”. 4 participants expressed enjoyment in not being able to resolve misinformation and fully understand WORLD4 e.g. P8: “to me, not having that knowledge was exciting.” We posit that results suggest an impression of undiscoverable hidden information is desirable but may yield a disorientating effect.

Theme 2: Shifting Meaning

This theme describes observations of participants’ comments that express spatial and narrative meaning derived from environmental elements, notably 3D objects. Observations highlight a contextual relationship between elements and changes in participant interpretation of the game world. This theme consists of two category codes: 1) awareness of context; and 2) combined context and shifting meaning.

Awareness of Context

Participants were observed to express awareness of and interest in 3D objects and environment characteristics, often commenting and comparing their stylistic traits during moments of exploration. These moments were observed to be associated with bold, more memorable points of interest e.g. P10: “The larger areas with distinct pieces were memorable”. All 14 participants were observed to be drawn towards the large hub atrium (see fig 1), expressed surprise and commented on the sense of scale and atmosphere e.g. P7: “it was endlessly upward and endlessly downward, it felt like you were a blip in this infinite universe”. Another example includes participant encounters with a small travelling red sphere object, which emits an alarm sound and moves through a corridor over an obscurred vertical shaft that players can fall in to (see fig 4). Because of its unusual characteristics all 14 participants were observed to move towards and track the sphere object, expressing uncertainty towards it. For example, P8: “I really wanted to follow the
Session: Paper Presentation

Results suggest participants applied arbitrary meanings and narratives to environment and objects based on their prominent characteristics and contextual properties. Such objects were articulated by P12 as containing: "a suspicious hint of a hidden meaning because of the unnatural aspect of the geometric shapes that seemed like ‘inhabitants’ of the place". We can understand that participants applied meanings to make sense of the game and game world.

Combined Context and Shifting Meaning

Over time participants became aware of the shared characteristics between repeating environmental elements, notably 3D objects. For example, the three animated red sphere objects discoverable in different locations (e.g. see fig 1; fig 2; fig 4). Each sphere has a similar red appearance and more are found near vertical shafts in the environment. All 14 players who unwittingly fell down shafts associated the fall with the sphere. Spheres in different locations were negatively characterized; participants were observed to describe the spheres as the same object because of their shared characteristics e.g. P6: "That’s that evil red sphere that made me fall through the ground. Maybe that’s an evil sphere and I shouldn’t follow it";

As participants became increasingly aware of the different sphere objects and their shared characteristics, contextual meanings associated changed as they played. E.g. P6: “It’s not actually evil, but I just thought it was because I thought it was making me fall through the ground, but it wasn’t, it was just the level. But he does make evil sounds, so he could be evil”. Participant 7 was observed to comment on a change in meaning derived from the spheres. P7: “Also the association, that I felt when I thought there was a platform beneath me, had a negative impact on [my perception of] the orb... I assumed that it was a negative object. But now I have made that perception, that the three are connected, which made me feel like the orb isn’t necessarily a bad thing”. P14 was observed to use knowledge of the sphere objects to identify and avoid vertical drops when navigating the environment.

4 participants compared repeating elements and speculated on their interpretative narrative and spatial meanings beyond our design intent. E.g. P7: “I was continually trying to figure out where they were and what their meaning was... I found out that the shapes had some sort of significance whenever I saw one”. Shifting interpretive readings suggest player interest in deriving a subjective ‘narrative of use’ through discovery of an implied relationship between 3D object artefacts.

Theme 3: Facilitating Subversion of Expectations

This theme describes a subversion of understandings of explorable 3D game space and genre. 7 of 14 participants commented that spatial characteristics challenged their existing knowledge of game spaces. Participants speculated if WORLD4 was a walker or puzzle game in genre. This theme consists of two category codes: 1) subversion of space; and 2) subversion of genre.

Subversion of Space

As participants explored WORLD4’s environment, they frequently questioned characteristics and nature of the game space. E.g. P12: “Overall I was intrigued and willing to decipher the world”; P9: “The experience in general was quite memorable. I found my spatial skills tested in a different kind of way”. This suggest players found WORLD4 different to representations of space in other games. We can understand that elements including spatial and visual inscrutability and irregularities subverted participants’ existing spatial knowledge. More broadly WORLD4 required a specific kind of ‘skill’ to ‘decipher’ the explorable game space. 6 of 14 participants describe their own theories as to how the game space could be understood, for example, if it was algorithmically generated; P6: “Okay, this definitely was not here before! Or I’m not just very observant. Maybe this is procedurally generating as you, like, unlock different paths?”. P9 expressed a sense of not having fully understood the space: “This game breeds a paranoia in the player, thinking about having overlooked something”.

Despite uncertainties observed, 13 participants expressed interest and enjoyment in negotiating and developing an understanding of the game space, despite a lack of clear resolution. Results suggest negotiation and exploration of spatial subversion as compelling in its own right.

Subversion of Genre

While playing participants questioned the nature of WORLD4 with reference to game genres, suggesting an uncertainty in expectations towards the overall game experience. 7 participants compared their WORLD4 experience to a puzzle game. E.g. P14: “I felt as though the entire space of the game was some interesting puzzle to solve. However, although WORLD4 was described as a puzzle game, descriptions were inconsistent as not all elements could be ‘solved’. E.g. P14: “I felt like there was some solution to be found since it seemed a bit puzzle-y, but that didn’t seem to be the case... I’m not sure how puzzle-y it is. If it is testing for things that are called walking simulators, in the imperative sense, most people would consider them trivial if they are described as such. Puzzles aren’t really a part of them”.

Participant feedback suggests WORLD4 presented an image of a puzzle game but was not a puzzle game experience. We may expand on this further, drawing upon a comment by P11: “The place feels like a puzzle to be explored, not solved. There are rules... that I am slowly discovering”. Participant comments suggest WORLD4 subverted expectations of being a walker and puzzle genre. This experience of questioning genre conventions was highlighted by P5: “It plays with the player’s mind and forces you to think in a different manner than what you would normally”. Comments suggest a subversion of game genre expectations in participant understandings of puzzle and walker games, and perhaps genre conventions more broadly.
STRATEGIES TO DESIGN AMBIGUOUS EXPLORATION ENVIRONMENTS

Based on the reported participant experience and our own design knowledge from creating WORLD 4 we present a set of prescriptive game design strategies, which seek to guide game designers in fostering ambiguity in first-person exploration games. Discussion focuses on ambiguity within a spatial-exploratory lens. We refer to themes to showcase how strategies may be used, and how ambiguity can be considered a powerful resource for exploratory game experiences. Game designers may use these strategies to design for ambiguity in their own exploration games and explorable 3D game environments.

1. Use Multiple Sets of Incomplete Information to Support Investigation

Results from Theme 1: The Design of Partial Incrutability suggests participant awareness was heightened because of multiple fragmented first-person views. This technique presented an overt onscreen information gap by concealing the game space between onscreen sources, providing explicit ambiguity of information [24, 11]. Participants were observed to become increasingly aware of the limitations of each individual view as a reliable information source. This made it challenging for participants to triangulate between each view during exploration and discern the environment, heightening their spatial awareness in noticing anomalies and differences. As suggested by Gaver et al. using “imprecise representations to emphasize uncertainty” involves the “blurring” of information to require users to fill in the information gaps that are “purposefully imprecise” [11].

Players may find interest and pleasure in negotiating this ambiguity and resolving information gaps. As suggested by Costikyan an awareness of hidden information may foster “a desire for exploration” to reveal and compare information differences [3]. We recommend the following considerations when implementing multiple sets of incomplete information explicitly fragmented through multiple sources:

Each source of information must limit the extent of information conveyed. Sources may share similarities but must diverge enough to create a gap. Each must be treated as mutually valuable in presenting worthwhile information to compel comparison by the player (e.g. using separate onscreen to locate pathways). By modifying the reliability of sources, their relationship may be altered so no single source is reliable. Additional sets of incomplete information may increase disruption, the likelihood of disorientation and features being missed. It is important to consider the design of the game space to support player adjustment and tolerance of potential disorientation, for example providing opportunities for players to control their navigation pace.

2. Remove Feedback to Compel Spatial Questions

This strategy describes two areas: 1) reduction of onscreen information feedback in the game world during player interaction; and 2) game progression feedback. In Theme 1: The Design of Partial Incrutability and Theme 2: Shifting Meaning participants questioned environmental elements.

Without feedback information to communicate an element’s purpose players may become perceptually curious towards understanding it. 1) Reduced information feedback suggests an alteration of solver’s uncertainty, defined as the type of uncertainty in puzzles or problems solvable by players [3]. A lack of information feedback may leave players uncertain about perceived problems they attempt to solve. This relates to Gaver et al.’s ambiguity tactic “expose inconsistencies to create a space of interpretation” [11], although within a navigational context. Without feedback, limitations are imposed in how players may discern what the ‘correct’ steps are and how a solution may be quantifiably known. This may result in a more interpretive environmental artefacts and game space.

2) Without progression feedback indicating the extent of the explored game space, participants comments reveal uncertainty towards the game and spatial boundaries of the environment. Gaver et al. identify that by casting doubt on sources of information participants must undertake an independent assessment, to understand a chain of cause and effect or if their more recent understandings match their past experiences [11]. Reduction of progression feedback may engage players in memorizing the environment, such as creating mental maps. We recommend the following consideration in removing audio-visual information and progression feedback:

Designers may consider reduction of audio-visual feedback, so the properties of an environmental element cannot be easily discerned on initial observation. Designers should consider how much of the game space they wish to withhold regarding player tolerance. Although questioning may increase, players may become negatively frustrated as the lack of certainty intensifies over play time. Designers may consider allowing players to modify variable types of feedback in-game to accommodate preference and not discourage exploration. Suggestions include subtle progression indicators (e.g. changing environmental signs in recurring locations) and interlace feedback (e.g. a guiding compass).

3. Use Spatial Tricks to Withhold Environmental Reveal

This strategy describes the application of spatial tricks which visually occlude and conceal the environment. Theme 1: Designing Purposeful Incrutability indicates participants were unsure of elements that presented incrutability when encountered, such as false walls and the removal of depth cues in rooms. Spatial tricks are initially difficult to discern by presenting overtly ambiguous information, encouraging players to work to verify them through interaction with the environment. Tricks present solver’s uncertainty [3] as players adjust to understand their characteristics and spatial properties. In doing so spatial tricks may block expected functionality [11] as they force player to question familiar representations of space e.g. common game level patterns. Spatial tricks may break navigation flow, slowing player
pace to adjust. Results suggest that as participants became aware of spatial tricks, there was expectation of additional tricks during navigation progression and when returning to explored locations. We suggest game designers can utilize spatial tricks to extend the reveal of the game environment. When applying spatial tricks, we recommend the following considerations:

Designers may consider how an immediate intuitive understanding of the 3D space can be disrupted to raise questions as to the overt, immediate visual and spatial realities of the game. For example, imposter walls may deceive player understanding that all surfaces are visible and solid, and blended surface materials may conceal spatial boundaries and navigable paths. Designers should consider placement of spatial tricks; closer to the player’s starting location decreases the likelihood that players will adjust to the trick on initial encounter, if other navigation options are available. Players unable to resolve the trick will bypass it, but questions may remain as to how it can be resolved, foreshadowing the possibility of discoverable information. By providing opportunities to return to previously explored locations, players may extend their exploration and investigate further, if they believe they have new insight. Designers can intensify the disruptiveness of a trick by adding an algorithmic component, such as the procedural generation of wall surfaces in Catacombs of Solaris [23]. The more inseparable the trick the greater potential for disorientation, which can be assessed through rapid player testing.

4. Use Misinformation to Disrupt Clear Understandings
Theme 1: Designing Purposeful Incredulity suggests participants encountered elements which gave an impression of legibility in being learned, understood, or solved, but were ultimately unintelligible and had no solution. This strategy describes misinformation as a useful method for disrupting player understanding of the game world by impressing intricate, mysterious, and contradictory environmental ambiguity. This relates to Gaver et al.’s suggestion to cast doubt on sources to provoke an independent assessment, and to implicate incompatible contexts to disrupt preconceptions [11]. In this context, spatial tricks may present misinformation as ‘solvable’ and compel players to question the nature of the game space and decide for themselves if misinformation should be given credence based on their interpretation. When using misinformation, we recommend the following considerations:

Misinformation can be considered as a type of designed deception. This approach includes an alteration of game world elements e.g. objects, that are typically clear or intuitive in presentation. Alterations must present an initial impression of legibility, for example, placed in proximity to clearer or negotiable elements like spatial tricks. This can imply an association or relationship between elements, thereby supporting deception e.g. a visible but impassable opening nearby another visible but passable opening. Misinformation should never be explained or provide an answer or solution. Elements associated with the misinformation should remain entirely ambiguous as to their purpose and meaning. Reduced feedback (see Strategy 2) may support this ambiguity. Allowing unintended glitches to surface can add variability in misinformation. Alternatively, designers may consider randomization or procedural approaches. However, designers should be aware that high frequency of misinformation may create unintelligibility and disorientation.

5. Design for Spectacle to Support Evocative Moments
In Theme 2: Shifting Meaning, participants encountered environmental elements whose characteristics evoked a response (e.g. the large central hub atrium). Parallels may be drawn with the design of narratively evocative game environments [25, 15]. Our results suggest these were memorable and significant moments influenced by visual and spatial characteristics, and settings in juxtaposition to other locations. This strategy describes the use of spectacle to support an evocative player response, that may foster interpretive narrative readings without incorporating a specific storytelling focus or narrative premise. We may relate this to Gaver et al.’s tactic in pointing out things without explaining why to encourage consideration of interpretive significance [11]. To design for spectacle, we recommend the following considerations:

Designers can juxtapose spatial elements in a localized area, specifically in-game stimuli – visual, spatial, animation and audio – that may be exaggerated in contrast to surrounding locations or elements. Placement of elements in spatial composition e.g. distance between elements in relation to the player perspective’s field of view, and the implications of using positive and negative space can draw player focus towards spectacle elements, to create a significant moment. For example, using leading sight lines to direct the player view and extended travel distance to create anticipation. Obscured sight lines and visual occlusion techniques may create surprise in a sudden location. Location and audio can add to memorable characterization or significant moments. Proximity-based audio may guide player view and navigation and create anticipation when used outside of clear sight lines.

6. Break Game Patterns to Support Deeper Interrogation
Theme 2: Shifting Meaning suggests that participants applied arbitrary meanings to environmental patterns in or near artefacts based on context. When the pattern was disrupted or broken, participants changed the meanings they attributed. As noted in Theme 3: Facilitating Subversion of Expectations, breaking of patterns may subvert expectations of space and game. This relates to Gaver et al.’s tactic for provoking ambiguity of relationship: offer unaccustomed roles to encourage imagination [11]. The pattern implies a narrative of use in functionality and meaning derived. By breaching the pattern, players may reflect on meanings they had attributed towards it and its idiosyncrasies. This strategy describes the breaking of environmental patterns through an introduction of variations and inconsistencies, to support
ongoing interrogation. We recommend the following considerations:

Player awareness of a pattern may be heightened through application of the pattern in variated contexts, for example using visual or spatial symbols in game levels [33]. The pattern can be disrupted through an introduction of obvious inconsistencies in pattern variation. Examples include an alteration of audio-visual or spatial properties of a repeating location or 3D object e.g. associated audio, scale, color, surface material, or animation. By placing pattern breaks after the pattern has been established, the break will appear more clearly analogous to consistencies perceived or known by the player. Unless the break is made apparent, the inconsistency will never be perceived or known. Recurring locations can heighten awareness of patterns and breaks through repetition, for example repeated player encounters with red sphere objects and vertical shafts in WORLD4, through recurring pathways and locations. Breaks may be repeated for further variation, although frequent breaks may dilute interpretive connections.

CONCLUSION

Our research goal was to utilize existing walker design traits identified by Muscat et al. [24] to create a game experience that was ambiguous yet playable. WORLD4 provides an exploration environment that fragments onscreen and in-world information, coupled to the player’s navigation and their abilities to perceive the game world. Through a two-stage qualitative player study of 14 participants we investigated the effect of WORLD4’s design through recorded game play observation, and an interview or questionnaire where participants answered questions relating to their game experience. We conducted open-coding and thematic analysis of the data, from which three main themes specific to WORLD4 were shown to affect the participants’ game experience. These included the fragmentation and disruption of spatial information, shifting meaning in the understood context of 3D artefacts, and subversion of spatial and game genre conventions.

We observed how visually and spatially inscrutable elements onscreen and in-environment heightened players’ perceptual awareness. Players’ early game play exploration became perceptual events that were at once curious and compelling, and appeared to subvert spatial and game understandings. Exploration activity appeared to be characterized by a sense of curiosity in resolving uncertainty. To make sense of uncertainty, players applied arbitrary meanings to environmental artefacts and spatial misinformation, as an overall strategy to make sense of the game world. By not making the relationship between navigation and spatial elements obvious, and by removing explicit audio-visual and progression feedback, investigative exploration was afforded. This effect exceeded our expectations in terms of both involved spatial navigation and narrative interpretation.

In response to the three themes, we have created six strategies as design guidelines. Each strategy builds on understandings of ambiguity such as those of Gaver et al. [11] which have been identified within existing walker game design by Muscat et al. [24]. The framework seeks to provide a spatially focused approach to game design that begins to address areas of designed ambiguity typically not prioritized within game design literature. Strategies intend to offer game designers some useful guidelines for fostering ambiguity in first-person exploration games and explorable 3D environments. The design strategies suggest techniques for fostering ambiguity by highlighting specific areas of consideration. Strategies include: limiting clarity through information fragmentation and feedback removal; disrupting navigation flow through occluding the environment and introducing misinformation; and supporting speculative readings through environmental spectacle and pattern-breaking. These strategies highlight how the relationship between in-game spatiality and navigational information may be manipulated through ambiguity, to make the environment resistant to scrutiny and being comprehensively ‘known’. This may manifest as an extended experience of exploratory curiosity.

Our research raises further questions towards the subject of ambiguity within game design. In future research we may investigate the extent to which ambiguity may be heightened and made even more resistant to scrutiny in exploration game design. For example, the use of conditional rendering and rules (e.g. timers, activation triggers, and object state changes). We might learn whether exploration engagement is further extended or diminished as ambiguity is made more extreme. The use of ambiguity to subvert game design conventions revealed a disruption of clear game play readings, for example, interpretations of WORLD4 as a puzzle game that could not be solved. We could further explore ambiguity as a subversive lens for game design more broadly, beyond an exploratory walker context. Potential avenues include the application of strategies for fostering ambiguity beyond a spatial-exploratory focus, which may provide more generalizable insights in designing ambiguity for game designers.

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We thank all the volunteer participants for their contribution to the study.

REFERENCES


359


Appendix D

This section provides additional information, download links and instructions for running and playing WORLD4, introduced in Chapter 4.

WORLD4 was created using a free version of Unity 5.0. 3D models were created in free software Blender. Audio was created using free software BFXR and Audacity.

Requirements:

WORLD4 will run on most Windows and Mac computers that can render 3D visuals and has been tested on a 2015 MacBook Air computer.

Download Links:

This version of WORLD4 was used in player studies discussed in Chapter 5.


WORLD4 for Mac: http://bit.ly/WORLD4mac

Running WORLD4:

Windows: Extract the .zip file downloaded, open the folder and double-click on WORLD4_playtest_windows.exe in Windows.

Mac: Extract the .zip file downloaded, open the folder and double-click on WORLD4_playtest_mac.app in MacOS.

When prompted I recommend selecting the visual settings 'good', 'beautiful', or 'fantastic', however this is dependent on your computer’s 3D rendering performance capabilities.
Controls:

WSAD to move. Mouse or trackpad to look. Right-mouse button to zoom view. Esc to quit.

Play-time Duration:

There is no time limit or restriction on how long WORLD4 should be played. Play for as long as you desire, quit at any time you choose.
Appendix E

This section provides information regarding Study 1, discussed in Chapter 5.

Information includes the following forms: participant invitations, participant information, participant consent, semi-structured interview questions.

Following this I note recruitment, and data capture information.

Study 1 was conducted under RMIT University Human Research Ethics Guidelines, RMIT College Human Ethics Advisory Network (CHEAN) approval number: 20227.
Understanding First-Person Walkers: Interactions, Structures, Meaning and Gameplay Experience in Game Design

Invitation

We are Alexander Muscat, Dr. Jonathan Duckworth, and Dr. Douglas Wilson. We are researchers at RMIT University. We are currently working on an PhD research project to investigate virtual walking experiences. We are interested in understanding how to effectively design for virtual walking experiences.

Looking for participants

We are looking for participants interested in playing games. You will be invited to play a game for up to 1-hour, followed with a 1-hour interview. You may play this game at a provided computer, or on your own computer. We are looking for people who might already play games or be interested in playing games, especially those that involve exploration of virtual environments.

Why participate?

We believe this is a great opportunity to contribute to the understanding of game design. This study may lead to a better understanding of designing virtual walking experiences and interactive systems involving environmental exploration.

Contact us

If you are interested to participate in our study, please contact Alexander Muscat. We will contact you to coordinate a time and location to play the game, or a copy of the game to play. We will also send you a “Participant Information Sheet” for you to read, to make sure you are happy with the conditions of the study before you partake.

We hope to hear from you
PARTICIPANT INFORMATION

Project Title: Understanding First-Person Walkers: Interactions, Structures, Meaning, and Gameplay Experience in Game Design

Investigators:

Mr. Alexander Muscat (Research Student)
Dr. Jonathan Duckworth (Chief Investigator)
Dr. Douglas Wilson

This is a research project being led by RMIT University. Please read the information from this sheet carefully and be confident that you understand its contents before deciding whether to participate. If you have any questions about the project, please do not hesitate to ask.

What is the project about?

- The aim of this research is to understand how to design of virtual walking experiences.
- This research focuses on how a person will play games designed as virtual walking experiences. We have designed and selected games which involve exploring a virtual environment. We want to understand how to design games that facilitate curiosity and intrigue.

If I agree to participate, what will I be required to do?

- All participation is voluntary. You are welcome to participate in one or more studies as part of this mixed-method research.
- If you agree to participate, you will be provided with a game. You may play this game at an assigned computer, or on your own computer. We are conducting coordinated playtests; where we will directly observe you playing the game, followed up with an interview.
- If played at an assigned computer we will take photos, record video, and take notes of participants playing the game. We will also ask questions related to the game. If played on your own computer we will request that you record your on-screen gameplay experience using the provided software, to be sent to the researcher.
- All recordings (photos, recordings, and notes) will be de-identified.
- Participants of the playtest and players with relevant insights from the playtests will be invited to a follow up semi-structured interview about player experience to discover the aspects of the game were most interesting to you, and what you noticed in the virtual environment. We will also ask you for some demographic information. We will audio-record the interview.

How long is this going to take?

- Playtests, location-based observation, and ad-hoc questions or remote will last for less than 1 hour.
- Scheduled semi-structured interviews will take approximately 1 hour.

Why have I been approached?
• You have been approached either because you signed up for our mailing list to be informed of opportunities to participate in research studies, you contacted us in regards to publicly displayed posters or word of mouth, or you were involved in a relevant special interest group (e.g. forum, conference, exhibition).

What are the possible risks or disadvantages?

• If you decide not to participate, this will in no way affect your relationship with RMIT University, your grades or treatment, or your relationship with any of the researchers.

What are the benefits associated with participation?

• You will assist the researchers to understand development of interactive frameworks for future social games and game-like interactive systems.

What will happen to the information I provide?

• The information you provide will help us write academic papers and make presentations about this research. We will not disclose your personal information.
• Any personal information that you provide can be disclosed only if (1) it is to protect you or others from harm, (2) a court order is produced, or (3) you provide the researchers with written permission.
• The research data will be kept securely at RMIT in a locked filing cabinet for a period of 5 years after publication, before being destroyed. In addition, electronic data will be kept on password-protected hard drives.

What are my rights as a participant?

• You have the right to withdraw from participation at any time.
• You have the right to have any unprocessed data withdrawn and destroyed, provided it can be reliably identified, and provided that doing so does not increase the risk to you.
• You have the right to have any questions answered at any time.

Where can I learn the outcomes of the project?

• The outcomes of the project will be published in academic publications, which will be made available on the ACM Digital Library and other relevant academic sources. Abridged versions of the results will also be made available in simple language on wgoddard.com.

Whom should I contact if I have any questions?

• You may contact any of the researchers if you have questions. If you have any concerns about participation you would not like to discuss with the researchers, you may contact the Ethics Officer, as below.

If you have any concerns about your participation in this project, which you do not wish to discuss with the researchers, then you can contact the Ethics Officer, Research Integrity, Governance and Systems, RMIT University, GPO Box 2476V VIC 3001. Tel: (03) 9925 2251 or email human.ethics@rmit.edu.au
PARTICIPANT CONSENT FORM

Project Title: Understanding First-Person Walkers: Interactions, Structures, Meaning, and Gameplay Experience in Game Design

Investigators: Mr. Alexander Muscat, Dr. Jonathan Duckworth, and Dr. Douglas Wilson

1. I have had the project explained to me, and I have read the information from the information sheet, which has been provided and which I can retain for my records.

2. I agree to participate in the research project as described.

3. I understand and agree that when playing the games as part of this study that notes will be taken, and I may be filmed and photographed. I agree to having my interview recorded (audio only).

4. I give permission to have these recordings published or presented in academic journals and conferences, websites and promotional material. I understand that not all images taken will be published.

5. I am free to withdraw from the project at any time and to withdraw images or video of me that have been previously supplied prior to any publication of the report.

6. Unless I withdraw from the project and withdraw my images or video, the files will remain with the main investigator in this project until such time as they are destroyed.

7. I understand that I will not be disadvantaged if I decide to stop participating at any time.

8. I acknowledge that:

   (a) I understand that my participation is voluntary and that I am free to withdraw from the project at any time and to withdraw any unprocessed data previously supplied.

   (b) The project is for the purpose of research. It may not be of direct benefit to me.

   (c) The privacy of the personal information I provide will be safeguarded and only disclosed where I have consented to the disclosure or as required by law.

   (d) The security of the research data will be protected during and after completion of the study. The data collected during the study may be published.

PARTICIPANT NAME: ____________________________

CONTACT (mobile): ____________________________

CONTACT (email): ____________________________

SIGNATURE: ____________________________ DATE: ____________

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If you have any concerns about your participation in this project, which you do not wish to discuss with the researchers, then you can contact the Ethics Officer, Research Integrity, Governance and Systems, RMIT University, GPO Box 2476V VIC 3001. Tel: (03) 9925 2251 or email human.ethics@rmit.edu.au
Understanding First-Person Walkers: Interactions, Structures, Meaning, and Gameplay Experience in Game Design
Sample Questions

A sample of questions used during our semi-structured interview are as follow:

- How would you describe the game?
- What were your motivations to play the game?
  - Were you motivated by the environment in the game?
  - Were you motivated by interaction aspects of the game?
- In the environment what did you notice?
- Did you find the pace of the game slow? Why / why not?
- Did you find it hard to navigate? Why / why not?
- Would you call this challenging? Why / why not?
- Would you call this engaging? Why / why not?
- What would you like changed in the game? Why?
- What was your most memorable experience about the game? What made that experience special?
- What was your best / worst experience?
- What could have been better?
Study 1: Recruitment:

A participant call-out was communicated through printed posters placed around the University. The posters stated an ‘opportunity to test a game prototype’ and ‘explore a unique game world’ using attractive game screenshots of WORLD4 to decorate.

Participants responded to the call-out via contact email, which was followed up with sign-up documentation, outlining requirements such as estimated length of the session and audio and visual recordings and questions. Participants were given opportunities to reschedule or cancel.

Invitation was voluntary and had no financial gain, gift cards, or tokens of appreciation.

Study 1: Data capture:

In each player study session three data points were recorded: 1) screen-capture video recording of gameplay; 2) audio recording via a microphone during gameplay and for the conversational interview; 3) initial handwritten ‘in the moment’ notes based on observations.

Video and audio recordings provided an uninterrupted capture of both in-game gameplay and comments. Handwritten notes captured specific points of interest noted in the moment, and were time stamped for returning to moments in video-capture.
Appendix F

In this section I provide additional information regarding Study 2, discussed in Chapter 5.

Information includes the participant sign-up webpage, participant submission webpage, data collection methods, participant questions, and participant recruitment via Twitter including promotional GIF image creation.

Study 2 was conducted under RMIT University Human Research Ethics Guidelines, RMIT College Human Ethics Advisory Network (CHEAN) approval number: 20227.

Study 2: Participant Sign-up & Submission Pages:
The sign-up and submission pages were created using Google Pages. Sign-ups and submissions only required an email.

The sign-up page featured a non-mandatory survey. This information supported the creation of the submission page. For example, the creation of a recording software video guide to assist participants, and the implementation of uploading options for recordings.

In addition, the survey contained a question asking if participants if had seen WORLD4 prior to the call-out to gauge prior experience and knowledge towards the game. None of the seven participants has seen WORLD4 before.
WORLD4 playtest sign up

You are invited to playtest WORLD4!
>>Explore multiple dimensions
>>Discover sights
>>Reveal the World

Your experience playing WORLD4 will help its ongoing development & my PhD research.

Testing requires:
- Playing WORLD4 on your mac or windows computer
- Recording your on-screen game experience and audio commentary
- Sending your recording back to me

After signing up you will receive a follow-up email with instructions and download links. Set up will require 10-15 minutes. WORLD4 requires at least 15 minutes of playing, at your own leisure. Submitting feedback and uploading your recording will require 25 minutes.

Questions? Get in touch via alexandermuscat(at)gmail(dot)com

Additional participant information can be found here: http://bit.ly/world4participantinformation
All recorded information is private. Testing is conducted under RMIT University Human Research Ethics guidelines, RMIT CHEAN Approval Number: 20227

* Required

Email address *

Your email

Preferred Name

Your answer
Have you seen WORLD4 before today?
- Yes
- No

Have you played WORLD4 before?
- Yes
- No

Have you used screen-capture recording software?
- Yes
- No

Does your computer have a microphone?
- Yes
- No

Can send or upload recorded video (e.g. via Dropbox or YouTube)?
- Yes
- No

Comments
Your answer

Send me a copy of my responses.

SUBMIT

Never submit passwords through Google Forms.
WORLD4 playtest

Thanks for signing up to playtest WORLD4, your contribution is much appreciated!

The playtest will take at least an hour in total of your time:
• 15 min: set up
• 15 min (at least): Playing at your own leisure
• 15 min: Uploading (depending on your internet speed)
• 10 min: Answering final questions

This page is separated into steps to guide you through playtesting and to collect your feedback:

Step 1: Downloading WORLD4
Step 2: Capture Software Setup
Step 3: Playtesting WORLD4
Step 4: Sending your WORLD4 Video Recording
Step 5: Final Questions and Feedback

Feel free to refer back to this page during your playtest.

If you have any issues or questions contact me via alexandermuscat(at)gmail(dot)com

Additional participant information can be found here: http://bit.ly/world4participantinformation
All recorded information is private. Testing is conducted under RMIT University Human Research Ethics guidelines, RMIT CHEAN Approval Number: 20227

* Required

Email address *

Your email

Preferred Name

Your answer

STEP 1: DOWNLOADING WORLD4

To download WORLD4 click on the blue download button after selecting one of the following links:

WORLD4 for Mac: http://bit.ly/WORLD4mac
To record your WORLD4 experience and comments while playing it is necessary to install software that captures your computer screen and microphone. This will be saved as a video file that can be sent to me.

I recommend the free OBS Recording Software which can be downloaded here: https://obsproject.com/download

Feel free to use preferred recording software (e.g. Quicktime) if you please!

If you are unsure how to set up OBS for capture recording or how to run WORLD4, I have provided a 6 minute guide below. Although done in Windows this guide applies to both Mac and Windows versions of OBS:
**STEP 3: PLAYTESTING WORLD4**

3.1 Confirmation of Consent ***IMPORTANT***:

At the start of your recording please vocally confirm that you are OK with being recorded and participating in the playtest e.g. 'I consent to this playtest and being recorded'.

At any time you may stop playing and recording if you feel uncomfortable or wish to quit.

3.2 Talking about your experience as you play:

When playing walk me through your experience. Speak out loud and comment on what you are seeing, hearing and thinking. Some suggested talking points are:

- What can you see?
- What did you notice?
- What do you think it is?
- Where are you going? Why?

At any time you may choose to not comment or talk about your play experience, and may quit or stop if you wish to.

3.3 Playing WORLD4:

Running WORLD4: Extract the .zip file downloaded, open the folder and double click on WORLD4_playtest_windows.exe in Windows or WORLD4_playtest_mac.app in MacOS. I recommend selecting the visual settings ‘good’ ‘beautiful’ or ‘fantastic’.

Controls: WSAD to move. Mouse or trackpad to look. Esc to quit.

Play time duration: There is no time limit or restriction on how long WORLD4 should be played. Play for as long as you desire, quit at any time you choose.

**STEP 4: SENDING YOUR WORLD4 VIDEO RECORDING**

Once you have recorded you game experience, send your video recording file via one of the following options:


Option 2: Upload your recording to a video hosting website as an unlisted video (e.g. [https://www.youtube.com](https://www.youtube.com)), and paste a link to the video below.

Option 3: Upload your recording to a file hosting website (e.g. [https://www.dropbox.com](https://www.dropbox.com) or [https://drive.google.com](https://drive.google.com)) and paste a public download link below.
STEP 5: FINAL QUESTIONS AND FEEDBACK

The following questions are to give me context when watching your recorded gameplay experiences:

How familiar are you with 'Walking Simulator' or Walker games (e.g. Dear Esther, Gone Home, Proteus, The Stanley Parable)? *

- Very familiar
- Quite familiar
- Unfamiliar

Describe how engaged you were whilst exploring WORLD4. *

Your answer

Should WORLD4 should provide explicit feedback on your progress when exploring? Describe whether it is important, or not. *

Your answer

Was exploring WORLD4 memorable? What was memorable and why? *

Your answer

Overall, how would you describe your experience with WORLD4? *

Your answer

How straightforward was it to set up the playtest and record your experience? *

- Clear
- Unclear
- Mixed (explain below)
If your answer was Mixed please elaborate:

Your answer

How did you find out about the playtest? *

- Twitter
- Word of mouth
- Knowing me (Alexander Muscat)
- Other social media platforms e.g. Facebook
- Other (explain below)

If your answer was Other please elaborate:

Your answer

Please leave any final thoughts or feedback below, or feel free send any additional comments or notes via email.

Final thoughts and feedback

Your answer

Thank you very much for providing your time to playtest WORLD4 and sharing your experience, thoughts and feedback with me!

Your efforts are very much appreciated and will do much to help shape the future of WORLD4 and my work within the field of game design research.

Following your submission I may contact you with additional questions regarding your feedback or comments.

If you have any questions or thoughts to share please get in touch.

Thanks again!

-Alex Muscat
The participant submission-page considered the following factors:

1. Easy download and operation of *WORLD4*: Slightly altered versions of *WORLD4* were provided for easier downloading and execution.

2. Capture software guide: Open Broadcast Software was chosen as free accessible, and easy to use capture software. My goal was to provide enough technical guidance, so participants could start playing *WORLD4* without worrying about technical complexities.

   I created a video tutorial to guide participants in setting up OBS software and recording microphone input with game audio and video. This was successful, although one participant had audio recording issues due to their hardware. In the future I’d suggest participants try a test recording before playing.

3. Playtesting guidance: I provided guidelines for players as part of the study. It was essential that participants vocally consent. Vocal confirmation was outlined (‘I consent to this playtest and being recorded’). I provided a disclaimer participant rights e.g. ending the playtest at any time and abstaining involvement. This was a simpler, more efficient method of receiving confirmation than signing and sending a written document.

   I also provided general guidelines for participants for vocalising their thoughts while playing: “When playing walk me through your experience. Speak out loud and comment on what you are seeing, hearing and thinking”. These can be viewed in the captured image above.

4. Uploading participant capture recording: The video file was potentially large and difficult to send. This process depended on participant internet connection, a highly variable factor. Participants were given three options to choose:
Option 1 direct video upload: Participants directly send their video file to my personal file-hosting Dropbox account anonymously, without logging in or signing up.

Option 2 Video hosting service: Participants upload their recordings to YouTube as an unlisted video, sending me a private viewable link, convenient for participants familiar with YouTube. I had privacy concerns with this approach, however participants had full control over the recording deleting or keeping it online.

Option 3 File hosting service: Participants uploaded their recording to a preferred personal file is host (e.g. Dropbox) to share with me. I had similar privacy concerns to option 2, but participants had full control over the file shared with me.

5. Survey Questions: At the end of the submission form I asked a series of non-mandatory questions. These included questions asking about player background experience with Walker games for contextual information, game experience reflection questions similar to those asked in the Study 1 interview, and methods questions. These can be viewed in the captured images above.

Participant Recruitment via Twitter

As discussed in Chapter 5, I promoted promote Study 2 via Twitter. To do so promotional material was required. My objective was to create clear and attractive ‘juicy’ posts. I decided to create animated GIF images to promote the study. Setup required recording game footage, converting clips of gameplay footage to the GIF image format, then overlaying text for information. In Twitter posts the GIF would be supported by written text.

Software used: Open Broadcast Software for capturing game footage, Gif Cam for gif capture, ezgif.com for gif editing (e.g. overlaid text).
GIF images were of captured ‘movements’ in WORLD4 that highlighted one of three aspects: Moving through the game space, a difference across four viewports, or spectacle of the environment. These gifs intended to provide an attractive and interesting glimpse of the game experience. I found the four viewports aspect to be a powerful gimmick that played well to the gif format, helping posts stand out against the ‘visual noise’ of a Twitter feed.

To promote Study 2 on Twitter I used GIF images created and linked to the sign-up webpage using shortened URLs with memorable titles using bit.ly.

I tried differently styled posts to that included text and a GIF image. My first was a plain and sympathetic request. Other posts varied on themes of call to action: “help the development of this game”, an interesting experience: “Discover 4 dimensions, explore the unknown, discover the unknown”, “I am not sure what this is are you?”. These were either directed at certain disciplines or interests or highlighted the mysterious or exploratory qualities of WORLD4 based on Study 1 observations.

I templated multiple Twitter posts for a week of posting. I used Tweet Deck to schedule posts for local and international time zones and regions and varied use of popular game hashtags for each post to increase circulation.

Much success on Twitter appears to depend on the nature of the content posted and social media reach. If a researcher is not already using Twitter this would be difficult. For example, I found posts that lacked a personal touch did not to receive a strong response, perhaps indicating expectations and the appeal of the platform.

The first post was successful in wide reach. Generating buzz in following tweets was difficult, with each following Twitter post there was an evident fall-off in response, however the first three posts continued to circulate on their own.
Traction and momentum is vital for reach. Regular frequency may increase chances of new and prior posts being noticed by users with much larger following. Retweets by users with larger followings will increase reach significantly as post ‘endorsements’ (a retweet in this instance is essentially an endorsement for the study and for myself). This kind of credibility or social capital on Twitter is important in driving online recruitment. My approach benefitted significantly from having an existing following and friends and colleagues on Twitter willing to for an initial ‘boost’.

Sustaining recruitment on Twitter alone is difficult. A multi-pronged approach would have likely seen better traction. For example, posting to forums like TIGSource.com or /r/GameDev on reddit.com dedicated to game developers, or other forums and communities. Appealing to more niche and smaller communities may have helped to sustain social media presence that may have fed back into Twitter posts.