DESEGMENTING A GAMEWORLD: THE SUPER MARIO SERIES

A Thesis
submitted to the Faculty of the
Graduate School of Arts and Sciences
of Georgetown University
in partial fulfillment of the requirements for the
degree of
Master of Arts
in Communication, Culture, and Technology

By

Ojas D Patel, B.A.

Washington, D.C.
April 18, 2018
DESEGMENTING A GAMEWORLD: THE SUPER MARIO SERIES

Ojas D Patel, B.A.

Thesis Advisor: Garrison LeMasters, d.Phil

ABSTRACT

Throughout game studies scholarship, the term “gameworld” has often been used to contain two notions simultaneously: the collections of characters, settings, and events made visible to the player by means of sounds and graphics; and the navigable virtual space of a videogame. Resisting this haphazard use, this study closely examines five videogames in the Super Mario series and presents its findings in context of two theories of gameworld: Seth Giddings’s theory of gameworld and Kristine Jørgensen’s theory of gameworld interfaces. This study employs two methods of analysis: iterative game analysis, a method that strategically utilizes the save state affordance of console emulators, and comparative game analysis, a method that uses a wide range of analytic tools across sets of other media forms and videogames. Chapter 1 offers an analysis of Super Mario World, the most salient feature of which is its interface metaphor: the world map. Chapter 2 investigates techniques used to segment gameplay, space, time, challenge, and narrative across Super Mario Bros. 1, Super Mario Bros. 2, Super Mario Bros. 3, Super Mario World, and Super Mario World 2: Yoshi’s Island. By investigating techniques of segmentation across a range of games that constitute the same gameworld, a method of analysis I am calling “desegmentation,” this study aims to make more robust the theorization of gameworld and future study of videogames.
ACKNOWLEDGEMENTS

The research and writing of this thesis is dedicated to everyone who helped along the way.

An expression of gratitude is due to:

my thesis committee,

Dr. Martin Irvine and Dr. Garrison LeMasters, without whom this thesis would be little more than a list of well-intentioned, misguided questions;

BB, who helped me make sense of graduate school and life itself;

my dear family whose support sustains me far more than food or water;

and to prana: the mystery and the revelation.

Many thanks,
Ojas D Patel
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>1</td>
</tr>
<tr>
<td>Game Studies: State of the Field</td>
<td>15</td>
</tr>
<tr>
<td>Methodology</td>
<td>36</td>
</tr>
<tr>
<td>Desegmenting <em>Super Mario World</em></td>
<td>51</td>
</tr>
<tr>
<td>Desegmenting the Super Mario Series</td>
<td>82</td>
</tr>
<tr>
<td>Conclusion</td>
<td>97</td>
</tr>
<tr>
<td>Works Cited</td>
<td>100</td>
</tr>
</tbody>
</table>
**LIST OF FIGURES**

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Ways to Study Games</td>
<td>16</td>
</tr>
<tr>
<td>1.2</td>
<td>Table of Gameplay Methods</td>
<td>23</td>
</tr>
<tr>
<td>1.3</td>
<td>Communication Model of MDA</td>
<td>26</td>
</tr>
<tr>
<td>3.1</td>
<td>Opening Credit Screen</td>
<td>55</td>
</tr>
<tr>
<td>3.2</td>
<td>Title Screen Iris-in Shot</td>
<td>56</td>
</tr>
<tr>
<td>3.3</td>
<td>New Game Cutscene</td>
<td>58</td>
</tr>
<tr>
<td>3.4</td>
<td>Boss Challenge Cutscene</td>
<td>59</td>
</tr>
<tr>
<td>3.5.1</td>
<td>Final Cutscene #1</td>
<td>60</td>
</tr>
<tr>
<td>3.5.2</td>
<td>Final Cutscene #2</td>
<td>60</td>
</tr>
<tr>
<td>3.6</td>
<td>The End Screen</td>
<td>61</td>
</tr>
<tr>
<td>3.7</td>
<td>Level Start Sequence</td>
<td>63</td>
</tr>
<tr>
<td>3.8</td>
<td>Intralayer Pipe Transition</td>
<td>65</td>
</tr>
<tr>
<td>3.9</td>
<td>Failure</td>
<td>67</td>
</tr>
<tr>
<td>3.10</td>
<td>Switch Palace Achievement Transition</td>
<td>69</td>
</tr>
<tr>
<td>3.11</td>
<td>Level Completion Transition</td>
<td>70</td>
</tr>
<tr>
<td>3.12</td>
<td>Selection Screen</td>
<td>73</td>
</tr>
<tr>
<td>3.13</td>
<td>World Map</td>
<td>76</td>
</tr>
<tr>
<td>4.1</td>
<td>Transition Screen</td>
<td>86</td>
</tr>
<tr>
<td>4.2.1</td>
<td><em>SMB</em> Level Transition</td>
<td>87</td>
</tr>
<tr>
<td>4.2.2</td>
<td><em>SMB2</em> Level Transition</td>
<td>87</td>
</tr>
<tr>
<td>4.3</td>
<td>Tabbed Folder Interface</td>
<td>89</td>
</tr>
</tbody>
</table>
Figure 4.4 Story in the Selection Screen Layer ............................................................ 93
Figure 4.5 SMW2 Title Screen ...................................................................................... 95
INTRODUCTION

Historically, the emergence of new media in a society is seldom a straightforward affair. In this era, the alluring promises made by digital media – fast and efficient communication, rigid technical infrastructure, and global interconnectedness – seem to have fostered false confidence and unreasonable expectations in the public regarding the privacy of their data; at the same time, the sheer abundance of data and its easy access may mean that many corporations built out of digital media are ill-prepared to provide the safeguards and the services they glibly offered the public at the start. In many cases, as in our own, these mistakes stem from a failure to understand that media and technology are not superficial to our lives but are integral to them.

The rapid social integration of videogames, a new but also extraordinarily prolific medium has alarmed more than a few members of society who seem certain that technologies are discrete, morally-charged, and ahistorical. Such issues as violence, bullying, addiction, anti-social tendencies, and even mass shootings have been invoked in the same breath as videogames. The earliest scholarship on videogames was satisfied to understand them merely as irritants and negative stimuli. So-called media-effects researchers led the investigation, excavating for a clear causal link between a player’s violent acts in-game and real-life violence in schools.

Research in the field is on-going, but controversial. According to one meta-analysis of such research, much of this work is merely a continuation of early investigations into the experience of violence in film and television (Anderson and Bushman 354). Scholars in this area conducted most videogames research for nearly three decades before a different group of scholars, drawing on their work in pop culture studies, philosophy, and computer science, began
to look past the question of "media-effects" in the late 1990s and early 2000s (Aarseth, “Computer Game Studies, Year One”) (Williams 449).

Game studies scholars take the subversive position that videogames themselves – not merely their social effects – are worthy of serious study. While the field is still too young and too diverse to reduce to any single claim, it is fair to say that these scholars agree that videogames are not a waste of time (as your employers, your educators, and your parents may have you think) and that videogames are probably not a detriment to society (as psychologists, news anchors, and our current executive administration may have you believe). Contemporary game studies scholars often assert that videogames are a novel form of expression and that they offer new forms of instruction and inquiry (Hart, “Getting into the Game”) (Gee, What Videogames Have to Teach Us about Literacy and Learning). Some scholars argue that videogames herald a new kind of art (Jenkins, “Games, the New Lively Art”).

And yet, as I stated at the top of this chapter, the introduction of new media is seldom a straightforward affair. And so even as more nuanced and more deliberate inquiry comes from game studies scholars, a sizeable portion of the public remains preoccupied with old ideas. President Trump, amidst a renewed gun control debate following the tragic Stoneman Douglas High School shooting on February 14, 2018, reinserted the media-effects position on gun violence, hinting that violence in videogames was likely to blame for the tragedy (Wilts).

Twenty-five years ago, there was no diverse community of researchers to meet this tired charge with as sophisticated a set of arguments and analytical tools as have been marshalled now.

With this thesis, I seek to become part of this conversation, focusing research on the videogame itself – *das ding*, the technical artifact, the *assemblage* – and resisting reactionaries
who blame this technology for social and personal ills. By studying and coming to understand some particular aspect of the medium, my aim in studying the videogame as an artifact is not to pretend that its meaning is laid bare before us, but to entrench the artifacts’ advancing positions in game studies alongside the social sciences.

**The Need for a Sturdy Videogame Artifact**

Out of the many research paradigms that have emerged in game studies’ short history, many have noted the medium’s capacity to, in effect, transport players to another world. The term *immersion* has been used to describe this experiential quality of games as “…the sensation of being surrounded by a completely other reality, as different as water is from air” (Murray 98). The metaphor in context of videogames describes player experience as one fundamentally removed from real, everyday life, one a player dives into by operating a game system.

The term “immersion,” the concept it stands for, and the type of experience it characterizes constitutes part of a growing site of disruption in this nascent field and the medium itself. On one hand, invoking the metaphor to describe player experience steps away from the efforts of media-effects research. As opposed to drawing a correlation between events in widely consumed games and widespread phenomena in real life, it centers on the player and their game system as its own isolated phenomenon. However, if immersion can be measured by how realistically the software models its world and is made ready for immersion, are not the cautions proposed by media-effects researchers well founded? If people can commit acts of violence in a cohesive other world, is it not possible they will do the same when they return to the real one?

Though this conception of immersion persists marginally in game studies scholarship, the majority of researchers have adopted a far more nuanced position. The most modest of
treatments retain the traditional conception of immersion as just one type of immersion among other forms, such as Jay David Bolter and Richard Grusin’s conceptions of immediacy and hypermediacy. Their notion is that any medium strives to make itself transparent (immediacy), but oftentimes its efforts to make itself transparent are also reminders that the experience is mediated (hypermediacy) (16). A jump cut between two people conversing in a film exemplifies this. While the technique affords continuity of a conversation within a single scene, it is the same technique that reminds us that it is a movie and that the medium can transition us between two positions in an instant.

The most castigating framework describes overreliance on the traditional conception of immersion as the “immersive fallacy” (Salen and Zimmerman 450). In this conception, they take issue with the position games have taken as part of a certain trajectory of technological history, that which melts away the reminders of mediation and makes the experience more immersive. In their conception, it is not the audiovisual output that makes videogames an immersive medium, but gameplay as the characterization of interaction with the medium, itself a “process of metacommunication, a double-consciousness in which the player is well aware of the artificiality of the play situation” (451). While they deal directly with researchers who have treated immersion in the prior way, they charge the burden of responsibility largely to the industry.

Console developers are quick to cash in on this widely adopted perception of games. “Step into the Rift,” reads the marketing slogan for the Oculus Rift, a virtual reality headset with a wide range of applications including videogames (GameSpot). The video advertisement teases the viewer with a short clip of gameplay, zooming in from a shot behind the headset into its sights, revealing vivid imagery of a battle in space from a pilot’s point of view, allowing the
viewer to temporarily step into the content offered by the system as if it were happening in front of them. Beyond videogames, VR headsets and technology comparable to videogames have a history of use in running combat simulations in training the U.S. military (Parkin). The equipment is used to simulate combat zones in which soldiers can train for battle without the potential harm of being in a real combat zone. And so the market of virtual reality thrives on its promise to offer reasonably representative simulations, the same sentiment that thirty years ago was a talking point for cautioning against the medium.

Different scholars handle this rift in immersion differently. Laura Ermi and Frans Mäyrä developed a comprehensive model to disambiguate different types of immersion known as the SCI model (sensory immersion, challenge immersion, and imaginative immersion) (8). Without diving too deep, suffice it to say that this research sought to deepen immersion by analyzing different relationships between the player and game system – the relationship between player and audiovisual output (sensory), the relationship between player and game rules and goals (challenge), and the relationship between player and narrative (imaginative). Building on divisions of types of immersion, Jesper Juul in Half-Real resigns the source and degree of immersion to player choice (6). He argues that videogames are themselves a medium that ride the line between simulating a cohesive, realistic world and breaking their realism through unrealistic game functions, such as game avatar regeneration, and unrealistic overlaid information, such as game avatar health. Instead of understanding immersion through a game’s effectiveness in modeling a cohesive world, this position considers player choices in engaging with different forms of information as a gauge.
Earlier, I describe the competing notions of immersion and the set of problems they introduce as a disruption. This is because the conflict that arises is one echoed in a debate following the emergence of game studies: the videogame as a medium for storytelling and the videogame as a medium for gameplay. The narratology vs. ludology debate, recounted more comprehensively in the next chapter, was fueled by scholars who divided themselves along these two conceptions of the medium (Kapell). While game studies has moved beyond this and more readily adapted nuance, let this stand as another type of disruption – two competing viewpoints that are in direct conflict with one another.

It is for this reason the videogame as artifact is an underpinning for this research. Game studies benefits from more clarity regarding the videogame artifact, the social networks in which it is most prominent, the characteristics of engagement with the artifact, and the properties of the artifact itself. By calling for a sturdier artifact, the intention is to highlight how particular conceptions of games and tendencies toward essentialism has a way of obscuring the artifact, making it pliable – something of a Rorschach test in which scholars of any background can see something of what they study in the artifact. By calling attention to the artifact and by identifying a need for research toward a sturdier artifact, I mean to say research must begin from the artifacts themselves and extend outward from there.

And so, the next section will outline another site of disruption. If competing notions of immersion make up one site, the second site of disruption regards the analytical tools that have been used to discuss immersion. Kristine Jørgensen places side-by-side with the immersive fallacy what she calls the transparency fallacy. This moves away from player experience and turns toward the artifact, referring to a certain design principle centered on game interfaces. The
fallacy is couched in a more widely held belief that a game is more immersive when the interface is made invisible. This is true insofar as it means that the interface itself is not a source of contention but facilitates contention with the content of the game (Mauger 37). The transparency fallacy characterizes the belief that part of making an interface invisible or transparent is liquidating all audiovisual information on screen that divorces system information from the audiovisual representation of the world – characters, places, dialogue, etc. (Jørgensen 31). And so here is a second site of disruption, having to do with two different impressions of how a game should represent its world. Jørgensen places this disruption at the intersection of gameworld and interface (what she resolves to call “gameworld interfaces”).

**Interface and Gameworld**

*The Routledge Companion to Video Game Studies* defines the interface in terms of its functions. It serves to “enable information to be provided, accessed, and applied;” it “mediates between two parties;” and ultimately it is a “shared boundary where the user wanting to fulfill a certain task meets the artifact or product enabling them to perform that task” (Mauger 32). The hardware interface of consumer VR headsets include a pair of controllers that respond to button presses and hand gestures as well as sensors inside the headset that respond to how the wearer’s head turns. Furthermore, custom controllers can be designed, like those in the shape of guns for military training. Certainly these devices act in the capacity as a translator, translating movements by the player into digital information that the system responds to in its audiovisual output. But how does a player come to make choices about how to interact with the content? If there are graphical elements that are part of the interface like a GUI, where does the interface end and content start?
In the case of *Super Mario World* (Nintendo, 1991), the controller for the Super Nintendo Entertainment Console (SNES, 1991) is certainly part of the interface. It offers a mechanism for input, a hardware controller embedded with a set of buttons, that sends a signal to the game system, always ready to receive the signal and respond to it by changing the state of the system and its audiovisual output. But if we regard the selection screen (Fig 3.12), part of the interface is also on-screen. The function of this screen is to allow the player to choose between three save files, three storage spaces for game data from previous sessions of play. To aid this navigation, the system presents the three save files similarly to how a table of contents section is laid out (such as the one used in this very document): it uses each line of text as a discrete save file, it names each save file with a variable (A, B, C), and it uses leaders (the ellipses) between the name of the file and the numerical representation of game progress. To navigate between these save files, the game uses a blinking red cursor that moves up and down when the player presses up or down on the controller respectively. Is the blinking red cursor not part of the interface? Is not the blinking red cursor a sort of shared boundary between hardware and system tasks? Is the presentation of the save files not part of the interface? And after the player chooses a save file, and the directional inputs on the controller move Mario, the game avatar, is Mario not part of the interface?

Kristine Jørgensen offers a radically different approach to understanding interface. For Mauger, the game interface sits somewhere between the game and the player. Mauger’s definition of interface places the player on one side, and game content such as graphics and narrative on the other side. Jørgensen argues firmly that the interface is composed of three elements: the input/output hardware, traditional PC interface devices on-screen that aid
interaction (windows, icons, menus, and pointers, or WIMP interfaces), and “the gameworld environment itself (22-23). In this conception of what she calls the “gameworld interface,” the boundary, the mediator that is the interface is drawn in a place to include the gameworld environment, meaning the audiovisual output representing time, space, and place. Not only do I agree, I will be spending much of this study advancing and developing this position. I believe it is in this conception of game interface we will find sturdiness for the game artifact. However, one place I am obliged to depart from Jørgensen is in her use of the term “gameworld.” While I agree with her stance on the game interface, and that the interface has some relation to gameworld, I will be developing a different definition of gameworld.

In the more prominent conception of game interface, the virtual environment would be on one side of the interface and the player on the other. The player uses hardware controllers to navigate this virtual environment and play the game, and the software interface would be such elements as pointers and navigable menus. However, it is this very viewpoint of interface that underlies the claim that immersion in games is defined by players forgetting that their experience is one that is mediated. Jørgensen points out that this view of immersion “lacks sensitivity to what kind of activity gameplay actually is and what the player’s goals are when he is playing a digital game. More generally, it is insensitive to the fact that different games and genres need different approaches to user-interface design” (31).

Jørgensen conceives that the virtual environment of the game is fundamentally part of the interface. She argues that the virtual environment is a presentation of system information and therefore must be considered as part of what makes up the interface, the boundary between the player and the game. We must ask, if such elements are part of the interface, what exactly is it an
interface to? Certainly this is challenged by the fact that the game itself takes place in the environment right? But if while I’m navigating a virtual city as a superhero, I see an innocent bystander being robbed, there is a quality of interface in the audiovisual output that functions as a translator, or as a mediator, informing me that I have a choice to ignore the event, or intervene. Again, what is it an interface to? I will return to this; for now, let it suffice that it is what stands between gameplay being an act of heroically fighting crime and heroically pushing buttons.

Here, I will challenge that what she is referring to as “gameworld” actually does not alone constitute the gameworld. She defines them as “world representations designed with a particular gameplay in mind and characterized by game-system information that enables meaningful player interaction” (3). She combines this with interface to make the argument that the game itself is the act of operating the “gameworld interface” (24). Where I take issue is this notion of “world representation.” It seems to be containing two discrete notions simultaneously: 1) the visible, virtual plane rendered by code and displayed on the player’s monitor; whether 2- or 3-dimensional, it approximates a physical space which can be navigated by the player and her in-game representation, an avatar; and 2) the “world” evoked by a videogame: the systems of nature, politics, culture, and causality – whether actually depicted or merely alluded to – that will contribute to the player’s experience.

Jørgensen is not the only writer to use the term gameworld in this way. The Game Ontology Project, an initiative to build a set of analytical tools for game studies scholars, though it does not offer a definition for gameworld itself, offers this definition for “cardinality of gameworld:” “The Cardinality of a Gameworld is an aggregate value of spatial freedom within a gameworld representing all possible dimensions in which movement can take place.”
In this definition, gameworld is explicitly referring to the virtual environment. In “Unlocking a Gameworld: The Rewards of Space and Time in Videogames,” Allison Gazzard also conceives of gameworld as the virtual environment as well as the conceptual setting being represented by it. Such use of gameworld conflates these two ideas, but it disregards that two different virtual environments in two different games may be representing the same conceptual place.

*Super Mario World* (Nintendo, 1990) takes place in a magical land referred to as Dinosaur Land. The game is spent traveling through several worlds, or collections of levels in discrete subdivisions of the area, as Mario, the player-avatar. The first world of this game, an island in Dinosaur Land, is named Yoshi’s Island. Uncoincidentally, the name of the game’s prequel is *Super Mario World 2: Yoshi’s Island* (Nintendo, 1995). In this game, the player travels through six worlds on Yoshi’s Island as a community of Yoshis help baby Mario find a kidnapped baby Luigi, his brother, and get them home. The whole setting of *SMW2* is the first world out of nine worlds in *SMW*. Are these two completely different gameworlds? Our working definition of it makes the answer unclear, as they are two completely different virtual environments, and yet they represent some of the same spaces. And so I introduce a new topology of gameworld that it would benefit the community of game scholars to inherit.

Seth Giddings, in *Gameworlds: Virtual Media and Children’s Everyday Play*, imagines a trans-medial definition of “gameworld,” one not limited to the medium of videogames. Rather, he starts from the notion of the “magic circle,” the boundary between real life and the time and space designated for an alternate reality of game rules to apply. Such a boundary is useful construct for understanding the situated context of gameplay, but it is not as efficient at
containing play and the events during play. In the same breath as digital gameworlds, he invokes this sort of children’s play and paracosms to suggest a continuity of this world, particularly in how it is artifactually instantiated in various media forms (10-11). He adds to these gameworlds a notion of hybridity, by including various merchandizing that occurs following the building of a gameworld, such as toys and novelty t-shirts (73). Advancing this conception of gameworld is another major aim of this study. I hold that a gameworld is not limited to the virtual environment within a single piece of game software but extends across games of the same series and the various cultural artifacts produced as a result of wide community support of the gameworld.

Such an argument is sure to be met with much contention, but I believe expanding the use of gameworld to this definition is a major puzzle piece that needs to be set. Especially because it resolves one of our hanging questions – if the virtual environment is part of the interface, what is the game interfacing to? On one hand, it is an interface to the interactions characterized as gameplay. But on the other and far more pertinent hand, it is an interface to this wider gameworld. In my new topology of gameworld, I have included the two notions previously held by the term gameworld. I have termed the navigable, virtual environment the system gameworld, and the world being represented the diegetic world. Refer to the methodology section for a more in-depth explanation of these terms.

**The Super Mario Series**

To ground these assertions, I have selected games from the Super Mario series for analysis. This gameworld is ripe for investigating the phenomena because it is among the first series of games to concern itself with building a gameworld. Furthermore, it is a gameworld that
has persisted since the 1980s and continues to be a source of meaningful engagement in many ways across various media platforms and community events.

As I discuss in my methodology, I’ve termed the process of analyzing a gameworld “desegmentation.” The term is inspired by various analytic tools used from the aforementioned Game Ontology Project, such as “segmentation of space” and “gameplay segmentation.” The system gameworld is fundamentally segmented across discrete spaces through which the interface is responsible for aiding navigation. In a similar way, the wider gameworld is fundamentally segmented across its many games, its many communities, and its many forms of engagement. To widen and sharpen the picture of the gameworld, we must analyze 1) how the gameworld is segmented and 2) how games within the gameworld are segmented. What follows is a closer look at the latter.

Chapter two offers a review of literature, assessing the state of the field of Game Studies. It reviews its short history, recalls important debates, critiques proposed models of analysis, and identifies the juncture at which it now finds itself. Beyond making the game artifact sturdy, game studies may find itself in a state of debate if it doesn’t resolve a conflict between what I’ve called procedural and player-centric camps of thought. Chapter three discusses the methodology I use in depth. I am not drawing from any particular methodological approach, but rather I am drawing from a wide range of analytic techniques appropriate to studying this phenomenon. The chapter delves into specific theoretical positions, processes of analysis, and terms of analysis that I have adapted for this study. Chapter four dives into an analysis of Super Mario World, specifically the grounding of the interface in its interface metaphor: the world map. And finally chapter five offers a comparative analysis of five games in the Super Mario series: Super Mario Bros.
(Nintendo, 1985), Super Mario Bros. 2 (Nintendo 1988), Super Mario Bros. 3 (Nintendo, 1988),
Super Mario World (Nintendo, 1990), and Super Mario World 2: Yoshi’s Island (Nintendo,
1995). By studying the gameworld of this series, drawing from techniques used to segment each
system as well as supplemental materials in game packaging such as game manuals, will help in
getting gameworld right and alleviating the pressure of some of the renewed debates around
violence.
GAME STUDIES: STATE OF THE FIELD

As is common knowledge for anyone who has studied videogames or just scanned the available literature on videogames, the emerging discipline of game studies is highly interdisciplinary and has welcomed a broad range of voices and methodologies. Extending theoretical orientations from literary studies, film studies, and new media, researchers with backgrounds ranging across numerous disciplines have turned their attention to studying the phenomena of videogames. Because of this, the state of this nascent field, to borrow from one of the most highly regarded researchers of games Ian Bogost, is a mess (2009). From semiotic analyses to critical analyses as they’ve been applied to literature, film, and digital media, the broad range of works that have been published since the induction of critical interest in games has become dense with questions about narrative (Henry Jenkins and Janet Murray), play (Espen Aarseth and Gonzalo Frasca), artistic merit (Henry Jenkins and Graeme Kirkpatrick), interactivity and immersion (Janet Murray), representation and simulation (Mark J.P. Wolf), literacy and education (James Paul Gee), and always in the background, engineers and computer scientists are driving the innovations that make the production of new forms of content possible.

For readers unfamiliar with the emerging discipline of game studies, great work has been done to identify subjects of interest using metric data of journal publications and communities of researchers (Couvoux et al, Melcer et al, Quandt et al). The most recent of those studies by Coavoux et al. presents a scientometric study which shows a clear focus on specific genres of games (MMORPGs and FPS) and topics of research (online social interaction, education, and design) in the conference proceedings of Game Studies, Games and Culture, and the Digital Games Research Association (DiGRA) (Fig 1.1). The researchers recognize a need for more
research in this area and acknowledge the limitation of using publications exclusive to game studies, but at a cursory glance, this shows a need to diversify the types of games and trajectories of inquiry to make the scholarly work of videogames more robust. For a starting place to recount the many theoretical perspectives and debates that have taken place, refer to the works of Casvean, Deterding, Malaby and Burke, and Aki Jarvinen.

Roughly, following the psychological research that explored correlations between violence and videogames which game studies scholars unanimously agree were asking the wrong
sorts of questions, the field of game studies prehistory starts with the works of Janet Murray and Espen Aarseth that critically examined how digital technologies reshape literary storytelling. This led to a divide between those who considered the videogame as a medium for storytelling and those who considered it a medium for gameplay. A turn was made then to examine a new way to think about the form of videogames, the analysis for which Bogost termed procedural rhetoric, an analytic tool that marks a major turning point for game studies and other disciplines derived from new media. The most pronounced problem that game studies faces now is whether it is more effective to study the formal properties of games, identifying individual components of a game system, or to study it while the game is in use by players. The following review of literature will handle summarizing some of the major contributions to these movements, including popular models of game analysis.

This section will accomplish three tasks: 1) it will provide an overview of the major conceptual problems addressed by the field’s major thinkers; 2) it will critically examine the models of game analysis that have been proposed; and 3) it will provide an overview of the literature that worked to develop the critical juncture at which this project works. The overview of the field will provide insight into the epistemic questions asked at the emergence of the field and place my work in the spectrum of literature that makes up the foundation of game studies. I will roughly summarize a few of the critical debates, theoretical positions, and trajectories of work that have been done. I will then critique the literature available on game analysis as a methodological practice and the models of analysis that have been proposed in the past two decades. Finally, it will review theory in the context of user interface and gameworld. The insight this review of literature will provide is that in order to sharpen the picture of game studies
research, there is a need for clearer and more well-defined organizing principles than are currently available.

How Should We Study Games?

Two of the most pervasive texts in game studies literature are Espen Aarseth’s *Cybertext: Perspectives on Ergodic Literature* and Janet Murray’s *Hamlet on the Holodeck: The Future of Narrative in Cyberspace*. For these two writers, studying games was informed by how narrative changes between traditional text in books and digital text in new media.

Aarseth finds a space for new theoretical work between the semiotics of user interface and narrative in literary theory. His work centers on cybertexts, texts that utilize the mechanical affordances of digital technology for narrative and possess an element of ergodicity, or “nontrivial effort” done on the part of the reader/player to engage with it (1). Referencing work on early games such as text-based adventure game *Adventure*, he argues that neither the semiotic analysis of new media, nor the narratology of the period were sufficient for examining these new forms of text, attempting to trace the similarities and differences between the properties of narrative and new media. But even at this juncture, he acknowledges that unwieldy treatment of the affordances of computers, discussing them in such terms as interactivity, show a need for a language specific to the types of content being produced using these new tools (47-48).

Janet Murray, while still dealing with the same problem, more explicitly treats digital media as a way of “reshap[ing] the spectrum of narrative expression” and continuing the “timeless bardic work within another framework” (10). By starting with representations of entertainment and narrative using digital technologies in fiction and television, namely the holodeck in the *Star Trek* series and cyberpunk literature, she idealizes these imaginative
platforms of storytelling as ways digital technologies can support and revolutionize the way people engage with narratives, even classical ones. This project differs greatly from Aarseth’s, though she does not exclude treatment of the affordances of digital technology. In fact, her treatment of procedural authorship would move on to inspire Ian Bogost’s theory of procedural rhetoric, a major turning point for work produced in game studies.

The response to these trajectories of thought in the works of Gonzala Frasca, a student of Espen Aarseth, emphasized that games are not simply a medium for storytelling. Rather, as Frasca calls for in “Ludology Meets Narratology,” game studies is in need of a ludology, or study of play and games. He argues that the primary reason this hasn’t been undertaken as a serious academic pursuit is because play as a mode of interaction, and games as a medium for play, have been ignored by scholars because of their low cultural status. Beyond the ineffective measurement of story in games as “narratology,” the introduction of ludology, adapted from the Latin term ludus coined by Roger Caillois, argued for the primacy of gameplay in studying videogames. This assertion put into the foray of games studies such foundational works on play and games such as John Huizinga’s *Homo Ludens*, Roger Caillois’s *Man, Play, and Games*, and Brian Sutton-Smith’s *The Ambiguity of Play*. This would then open up a field for debate among the foundational researchers of game studies: “Once open, each of these two apparently divergent ways of analyzing video games attracted supporters who fueled the academic dialogue between narratologists (Henry Jenkins, Brenda Laurel, Janet Murray, Marie-Laure Ryan, Michael Mateas, Nick Montfort) and ludologists (Espen Aarseth, Gonzalo Frasca, Markku Eskelinen, Jesper Juul, Noah Wardrip-Fruin, Ian Bogost, Eric Zimmerman)” (Casvean 52). Against the backdrop of games as abject media emerging as a subject of interest for study to
scholars, questions of aesthetics and artistic merit, a need for language to discuss game design, its properties as a form of media, and this division between storytelling and gameplay formulated the foundations on which game studies would build itself.

This should not be understood to delimit the topics with which the above writers engaged this debate, nor account for all of the researchers who partook and continue to partake in writing on this topic, but rather works to chart some of the major thinkers in the field based on this dichotomy. Trajectories of research beyond these types of works which are well documented in the texts of Mark J.P. Wolf and Bernard mauger, include game ontology, game design, game narratives, ethics of games, ideologies in games, player psychology, and the many cultures of players and playing (Casvean 54).

An explosion of work studying videogames, as well as conferences that assembled games researchers and journals that published them, followed these divisions of party lines. As useful as this movement in the field was, it limited its view in trying to understand the content of games. Are videogames extensions of the traditions of storytelling or playing games? Are videogames representing the world or simulating the world (Frasca 223)? However, this debate, among many of its shortcomings, failed to address the particularity of using computer hardware as a medium for creating content that encoded meaning. To this end, Ian Bogost’s coining of procedural rhetoric marks a major turning point between thinking of the game as a complication of its content in relation to story and gameplay, to its form in relation to hardware and software. The concept argues that because it relies on computation, a technology that relies on carefully defined and programmed processes, videogame scholars should thinking about games’ processes as a type of rhetoric, as an analytic tool for study. This movement launched the growing body of
works that fall under the moniker platform studies, research that centers on technical details of
game platforms, especially home consoles. This also launched the research area of serious games
and the application of games for education, training, and simulation.

In response to wide scale adoption of procedural rhetoric in game studies, Miguel Sicart,
who writes extensively on ethics in games, reminds us that a formalist approach to studying
games leaves out one of the most fundamental units of analysis within a game system: the player.
He concedes to the strengths of proceduralism, acknowledging, “first, it provided an argument
for those invested in considering computer games as a valid cultural means of communication;
and second, it provided a new theoretical foundation, based on a multidisciplinary approach to
crputer games scholarship, to the serious games movement.” However, citing T.L. Taylor’s
notion of instrumental play and the emergent properties of play in designed systems, he cautions
against proceduralism as it leaves out considering the emergent properties of games that can only
be accounted for in observing the game as it is being played. There are a wide number of studies
in anthropology, a genre that has come to be known as virtual ethnography, that focus on the
situatedness of play that can attest to this property of games, particularly in massively
multiplayer online role-playing games (MMORPG). One such work is My Life as a Night Elf
Priest by Bonnie A. Nardi. Such works clearly are strong for studying the cultural dimension of
games but also give insight to how the process of play can affect player experiences as much as,
and sometimes more so than, the formal aspects of the game. Proceduralism also can’t speak as
well to those phenomena that occur in the situated context of games but are more informed by
player choices and configurations outside the game state.
So first, the emerging field concerned itself with videogames in relation to storytelling. To challenge this notion, another school of thought proposed that perhaps play is a better mechanism for understanding videogames as a medium. The discussion after fizzling out from raising the question was then framed – instead of considering how videogames tell stories or allow for play, perhaps we should consider games in relation to their form in digital technologies. The discussion then was divided between the techno-historical and player-centric. Of course, the trouble with this field is that it was thirty years late to the game – videogames had emerged as a widescale cultural phenomenon in the 1970s and only by the late 1990s and early 2000s did academic communities truly start to engage with the new cultural form. Judging from the clusters of games and subjects that have been engaged, there is a need to diversify even further this already booming field.

This roughly organizes the core of what has been at stake in this emerging field of game studies. There have certainly been other topics of interest, closely studying the properties of spatial and temporal representations in games, the aesthetics of games, the history of games, problems of representation in games, agency and immersion in games, study of gaming cultures, psychology of game playing; however, these areas of interest, while equally integral to the ecosystem of the field, channel the energy of pre-existing modes of knowledge production. At stake in this study is a mode of knowledge production germane to the phenomena of games and formalizing systems of study. Platform studies and serious games launched two trajectories of study, however, these are only two of the properties of games that make them unique.

The next step is a refinement of the concepts and analytic tools that have emerged from the field thus far. This includes delimiting the use of certain terms, such as “gameworld” and
“interface,” and refining methods of analysis. What follows is a critique of dominant models of analysis that have been proposed, and then a look into the works that inform this study.

**Game Analysis**

Two considerations must be made in taking on game analysis as a practice: the method of play and the method of analysis. For interested readers, van Vught and Glas provide an excellent summary of the debate around using gameplay as a method of research. The problem is if games are a system that must be in use to observe, how do researchers handle the situatedness of play? The debate is roughly divided between two standpoints: that game analysis should analyze the formal components (game as object), or that it should analyze play actions (game as process) (van Vught and Glas 4) (Fig 1.2).

<table>
<thead>
<tr>
<th>Considering Play</th>
<th>Considering Context</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Games as object</strong></td>
<td><strong>Game Context</strong></td>
</tr>
<tr>
<td>Instrumental play</td>
<td>Cultural</td>
</tr>
<tr>
<td>- gameplay condition</td>
<td>- Genre</td>
</tr>
<tr>
<td>- rational play</td>
<td>- technological</td>
</tr>
<tr>
<td>- cooperative play</td>
<td>- Economic</td>
</tr>
<tr>
<td><strong>Games as process</strong></td>
<td><strong>Player Context</strong></td>
</tr>
<tr>
<td>Free play</td>
<td>Reflexivity</td>
</tr>
<tr>
<td>- Transgressive play</td>
<td>- Situatedness</td>
</tr>
<tr>
<td>- Cheating</td>
<td></td>
</tr>
<tr>
<td>- Going Native</td>
<td></td>
</tr>
</tbody>
</table>

*Figure 1.2 Table of Gameplay Methods.* (van Vught and Glas 15).

The approach to using gameplay as an analytic procedure is problematized in different ways depending on one’s stance in this spectrum. Not to be overly deterministic about how one’s gameplay approach affects research results, this graph shows ways the two correlate. How I will handle using gameplay as a research method will be discussed more thoroughly in the
methodologies section. Suffice it to say for now, I agree with the stance that van Vught, and Glas have taken: that the approach to play taken in the process of analysis must be recounted in detail, and how one plays affects what observations and insights are gleaned.

The question of the method of analysis becomes complicated too, as the available models are supported by disparate underlying assumptions that shape the process and products of analysis. The purpose of recounting the many analytic methods that have been proposed is not to make the argument that these are crucial models to use in systematic paradigms of study, nor to question the importance of the work, but rather to make the claim that there are a number of researchers that recognize a need for some kind of paradigm in studying the content of games, and to find the centrality of this effort within these researchers’ work.

In hopes of working towards a paradigm where students in university programs can spend a week studying and playing “2D platform games” in a course titled “Intro to Game Studies,” this study works to synthesize the efforts made into a methodology to be used in this study and work with the many other voices to peak our research into a wave of exciting new study and research. The first step is to hold under careful scrutiny the underlying assumptions that inform the particular analytic approaches that have been taken, and to find soundness between the form of the videogame and the process used to analyze it. The goal of this is not account for everything that has been proposed, but to find some of the major problems that have been addressed by our models for analysis and what the current set of problems is. Where I insert myself is not necessarily from a place that builds from the insights these methods offered us, as valuable as they are for certain perspectives, but for what they overlooked. Once again, for a
comprehensive overview of analytic methods available, see Casvean’s articles “Landmarks for the Contemporary Analysis of the Video Games.”

Most models for game analysis have come from perspectives of design, textual analysis, and methods derived from film studies. They have appeared sporadically throughout game studies journals, conference proceedings, design literature, and industry publications. The game design perspective of game analysis has certainly garnered the most gravity, and perhaps this is because academic institutions that support the study of games are teaching game design as opposed to studying game artifacts in themselves. Designers are undeniably among the key figures that make the cultural phenomena of videogames possible, but I hesitate to adopt the notion that the designer’s perspective affords the clearest trajectory of analysis. Truly thinking like a designer would require adopting such mental constraints as budget, production scheduling, and iterative design that are often fundamental for explaining final design choices of a game, but may be extraneous in an analysis for the study of games. Furthermore, designers are probably often more interested in what the player’s perspective is. In the way that literary studies scholars are expert readers, and film studies scholars are expert viewers, game studies needs a community of expert players.

Doug Church, a game designer, identified the problem of a language for game design before the founding of game studies as a discipline, before the many models of analysis emerged from scholars who align their projects with the game studies mission(s). Writing in 1999, he said, “design vocabulary today is essentially specific to individual games or genres. You can talk about balancing each race's unit costs, or unit count versus power trade-offs. But we would be hard pressed to show many examples of how innovations in RTS games have helped role-playing
26 games (RPGs) get better. In fact, we might have a hard time describing what could be shared” (“Formal Abstract Design Tools”). His diagnosis for the problem in discussing design is that there is no language to discuss common design elements between games, especially across genres which for him is a problem because it stunts the potential innovation of games within genres. But for him, and for many of the models used for analysis, the emphasis is on design. A language for game design was missing at the time he was writing in 1999, and certainly there was a need for a way to discuss games from the perspective of design to reach a precision in language as we have now in design literature such as the clarity between objectives and goals (Fullerton). This study does not argue that such a language in design is not fundamentally important; rather, it takes the position that the language designers take is different from the sort of position needed from scholars who are conducting game analysis. However, as I hope you will see by the end of this review, the model of analysis I propose to systematically compare a single feature across carefully selected sets of games will glean the sorts of insight that Church was looking for in proposing FADTs.

One of the most prolific design models of analysis for videogames proposed in 2004 and is still in use is the MDA model, MDA being an acronym for mechanics, dynamics, and aesthetics (Hunicke, et al). The model stresses a bilateral communication process between players and designers via the game artifact (Fig 1.3). The communication process is bilateral because designers iteratively shape the game for specific player experiences, keeping the player

![](image)

**Figure 1.3 Communication Model of MDA.** (Hunicke 2).
in mind throughout the process, and players come to understand what experience the designers intended for them. The strength of this model was to move beyond the phenomenological experience of play within a game. To analyze a game by using the sequence of events during play as a text for analysis is a flawed model as it discounts the limitless range of possible experiences and affordances of engagement with the game artifact (although, as I will discuss in a moment, there are other ways to approach the game as a text). It sets the precedent that there are three separate systems of gameplay that must be taken into account: mechanics - “the particular components of the game, at the level of data representation and algorithms;” dynamics - “the run-time behavior of the mechanics acting on player inputs and each others’ outputs over time;” and aesthetics - “the desirable emotional responses evoked in the player, when she interacts with the game system” (Hunicke et al). This is an important revision to the idea of gameplay as text as it gives language to complex systems in gameplay, and resolves some of the problems regarding gameplay as text.

However, this model does come at a cost with its own set of problems. A bilateral model of communication is overly reductive, as the game artifact, considered as a medium of communication, can be better understood in a model of communication that reaches far beyond its mediation between producer and consumer (see section on gameworld). In the vein of considering the game as a medium for communication, a more effective model would consider the relation of games within themselves, and then put games as a medium into a model with other media and producers and consumers of other media. Even the reduction of the community of games to producers and consumers is overly reductive.
Roberto Dillon in revising the MDA model with his 6-11 framework and AGE model (actions, gameplay, experience) also addresses this. He writes, “game designers like Schreiber and Brathwaite consider mechanics as synonyms of rules, spanning every phase of the game from the initial setup of game tokens onwards, while others, like Järvinen or, more recently, Koster, tend to draw a clear distinction between the two. Similar disagreements can be found when trying to strictly differentiate between ‘mechanics’ and ‘dynamics’” (“Teaching Games through the AGE Framework” 2). To truly write from a design approach would also need to account for the varying definitions of the constructs used to analyze games by designers. As the above suggests, how rules and mechanics differ is not just a matter of semantics, but underlies a difference in thinking about how to treat abstractions such as mechanics and dynamics in context of a larger system. The difference could provide an area of research, but perhaps this direction is beyond the point of game analysis for the sake of game studies.

Robert Dillon’s models certainly do much to move the perspective taken in game analysis from the position of designer to player. Firstly, the language being used differs greatly from MDA; it moves from pedantically technical terms (mechanics, dynamics, and aesthetics) to language that is more precise from a player experience perspective (actions, gameplay, experience). As mentioned earlier, even design literature has adapted more of a player’s perspective. In the same way Dillon treats actions, or “the core, atomic actions that a player can perform in a game, usually described in terms of verbs,” Anna Anthropy refers to the development and strengthening of verbs in the process of design (A Game Design Vocabulary – “Rules”). Actions and verbs (which are synonymous) provide a term that represents a dimension of gameplay that aligns neither with designer, nor player, but describes the abstraction of the
players’ agency in changing the game state. Dillon also replaces aesthetics, another term proposed by MDA that was met with much duress, with experience, a way of talking about the phenomenological interpretation of and emotional response to gameplay. He offers the 6-11 Framework for furthering this, as a way of bypassing the now defunct notion of “fun” that MDA’s notion of aesthetics was built on. The 6-11 Framework works with the underlying assumption that “games can be so engaging at a subconscious level because they successfully rely on a subset of basic emotions and instincts which are common and deeply rooted into all of us” (Dillon 2011). Does AGE and 6-11 overemphasize the pragmatist or functional approach to studying games? What about how functions and objects in videogames relate to other media or to other games? These improvements certainly solve some of the core problems of MDA, but it still underlies another set of problems.

This set of problems is one that deeply informed the narratology/ludology debate. It asks what factors about games are important to consider? To introduce one of the more formalist methods of analysis, Clara Fernández-Vara in *Introduction to Game Analysis* offers a method of analysis that builds on textual analysis as a method for studying literature. Starting on grounds of approaching the game as a text, she identifies ways textual analysis has been adapted to other mediums, such as the film and performance, as an argument for why it’s appropriate to use for games. She invokes Gerard Genette’s theory of paratext and Alan McKee’s methodology text on textual analysis to advance her own “building blocks” approach to game analysis that emphasizes a breakdown of analytic work into three categories: context, game overview, and formal aspects (Fernández-Vara 13). She uses context to discuss the cultural norms of videogames such as the ways communities engage with videogames through forums, streaming
videos, development logs, genre, and other such conventions that have emerged since the phenomena of videogames began. Game overview is an area that handles the impression of a videogame through gameplay as well as the many modes of interaction with the game that may not have been intended by the designer, such as modding and cheat codes. Formal aspects handles the game system’s hardware, software, and interface from a formalist or structuralist perspective. This work was an important stepping stone for game studies in formulating a method of analysis that does not exclude the many perspectives and voices that have emerged in the field, embracing both formalism and pragmatism in the complex social architecture that currently constitutes game studies.

How curious a book on game analysis would internally refer to this process as textual analysis. The movement made is twofold: 1) to argue that textual analysis as a process is one that has never been about sequences of typographic characters, but has always considered the relationship between the form and the meaning extracted by readers; and 2) to put videogames in the trajectory of research that uses this methodology. This allows for the paradigms of structuralism and poststructuralism, which Fernández-Vara identifies as process of discovering relations between games and sense-making within games, to enter paradigms of researching games (11). This metaphorical way of relating the study of games to studies of culture, literature, and other fields that made use of structuralism and poststructuralism is an unnecessary crutch for the founding of a method of analysis germane to the videogame artifact (as opposed to the videogame text). Rather, it may be more beneficial to restrain from putting the analysis of games in a continuum of scholarship in other media, as it cuts a little too close to the dilemma of narratologists.
Other models include TETRAD from Jesse Schell (designer’s perspective), layers of analysis by Konzack Lars (hardware, program code, functionality, gameplay, meaning, referentiality and socio-culture), Mia Consalvo and Nathan Dutton’s methodological toolkit (object inventory, interface study, interaction map, and gameplay log), Steven Malliet’s elements of representation (audiovisual style and narration) and elements of simulation (controls, goals, character/object structure, user input, game world), and all of them introduce something valuable to the study of games, in the way they dissect the games and make observable phenomena out of the many possible units of analysis of the game.

Videogame scholars have done much work to identify the many ways of considering the game as an artifact and to analyze the phenomena of gameplay or studying the game artifact as a system, text, or cultural artifact. Where I differ is the goal of analysis – it is not to make sense of how to make better games, how to understand how a specific game functions, or to further a particular model of study. Rather, my goal is to understand the phenomena of gameworld which can across a range of games, genres, and even mediums.

**Spatiotemporal Representation, Gameworld, and Interface**

The challenging part about working at this intersection is that the work that discusses spatiotemporal representations, interface, and gameworld are disparate and often engaging with disparate bodies of work. Mark J.P. Wolf writes from a film studies background, Jose Zagal et al write to advance their game ontology project, of which their methodological model greatly influences this study, and Kristine Jørgensen presents one of the very few works that advances a position that works to engage with all of these related trajectories of inquiry simultaneously.
Early work on this topic layed the foundation for theoretical approaches to gameworld by first working with spatiotemporal representation in games. Mark J.P. Wolf, among other scholars with a film/tv studies background, identified ways games drew from film and television, particularly movement in 3D space. However, he also notes technological constraints within which games had to innovate uses of space: 1) the lack of a filmic referent, or space to be filmed; 2) a lack of default structure for off-screen space; and 3) player control over point of view (51-52). Such constraints led to the following paradigms of space representation in games: 1) “no visual space,” in which space was represented by language in the way fiction represents space; 2) “one screen contained,” in which all gameplay took place in a fixed x,y field divided by maze-like grids to constrain movement; 3) “one screen contained with wraparound,” which would allow for continuous movement offscreen, meaning if the player avatar moved off screen to the left, it would reemerge on the right side of the screen; 4) “scrolling on one axis,” which allowed for the earliest platform games and side scroll to represent continuous movement along a plane; 5) “scrolling on two axes,” allowing for more elaborate platform games and scrolling through simulated environments; 6) “adjacent spaces displayed one at a time,” which do not scroll along an axis, but allow for free range of movement in a single screen and scrolls to another discrete screen when the player-avatar moves off-screen; 7) “layers of independently moving planes with multiple scrolling backgrounds,” allowing for a sense of depth in side scroller games and much more elaborate level design in the implementation of parallax; 8) “z-axis movement,” which modeled the camera movement in film where objects would get bigger as you moved closer then move off screen; 9) “multiple nonadjacent spaces,” which allowed for splitscreen multiplayer games, a single screen that portioned the space into two different fields for interactive

Countering Wolf’s anchor in film studies, Jose P. Zagal, Michael Mateas, and Clara Vara-Fernández closely study the diaspora of representations of space in games themselves, identifying in the course of their Game Ontology Project four fundamental ontologies: interface, rules, entity manipulation, and goals (“Main Page”). They would go on to study a broad range of game features using game analysis as a method to extract vital features of games and advance this project, deriving useful constructs such as gameplay segmentation and spatial configuration (Zagal et al; Clara-Fernández et al). Such work strives to abandon systems of classifying games based on features of other media, such as themes in storytelling and visual representation, and start classifying based on properties germane to videogames. While Wolf did contribute excellent work in identifying properties that did explicitly draw from film studies, and also divide this from work germane to games such as classification of genre based on distinctions in gameplay, Zagal’s team approached the systematic work of using game analysis as a method to formalize definitions and classifications that were built from games in themselves.

Such discussion of how space and time are represented are vital for the study of games, as these are some of the formal properties that build a system in which gameplay is possible. Most importantly for this study, it made more a much more refined discussion of Gameworld. Gameworld is a concept that is wielded quite haphazardly as it is used in anthropology studying MMORPGs (Rowlands, Nardi). Such texts identified the gameworld as a fusion between virtual space and the fictional world it simulated enclosed by the “magic circle,” a concept rooted in *Homo Ludens* that denotes the boundary between the real world and the apportioned time and
space in which an agreed upon set of rules supersede the norm. Janet Murray and her narrative-centric approach to games mirrors this sort of understanding of gameworld. However, Jesper Juul in *Half-Real* wrote extensively on why such an approach is insufficient, particularly because to what degree players engage with the fiction of the world is always a choice (6). Furthermore, the world itself is always being disrupted by non-diegetic elements such as lives and regeneration, or simply because the immersivity of first-person POV is interrupted by an extra-diegetic Heads-Up Display, or HUD.

Such an argument turns to interface, yet here, little research has been done to fully investigate the relationship between diegesis of games and interface. Such a gap in research would contribute to why a section on interface in *The Routledge Companion to Video Game Studies* would include this jarring quote:

A hypermediated game interface such as the one portrayed in the massively multiplayer space simulation *Eve Online* (CCP Games, 2003) may make the buttons, menus motions, or artistic elements of the GUI the focal point, instead of game contents such as actions, graphics, rules or narrative information, which can be counterintuitive. The interface should never demand more attention than the gameplay itself. Deep immersion with a game will only start after a user is no longer conscious of the interface during the decision-making processes within the experience of play (Mauger 37).

Such a reductive claim fails to acknowledge why players are playing *Eve Online* and what information is needed while players are engaged. However, discussions of immersion in games in marketing and critique often hinge on this understanding of immersion: the less present the interface, the more immersive and “intuitive” the game.
Kristine Jørgensen’s *Gameworld Interfaces* addresses this by developing a theoretical framework that if we think about gameplay as an abstraction of user input changing the game state, we should be thinking about the representations of information as the interface (2). Therefore, it is not only the hardware interface, navigable menus, and different means of providing input that make up the interface, but the graphic elements representing the diegetic world that abstract hidden game system information. This is why thinking of the interface and story as two competing elements is insufficient, and the juncture at which my research will contribute.

However, Jørgensen too makes the mistake of limiting gameworld to what is within the magic circle. Seth Giddings, in *Gameworld: Virtual Media and Children’s Everyday Play*, acknowledges that the world of a game is not limited to what is within this magic circle, but extends far beyond it throughout various forms of media:

To talk of digital gameworlds in the same breath as the imaginary spaces of children’s literature and the everyday fabrication of paracosms is to assert a strong continuity of worldness through children’s imaginative play and media culture and across centuries. It is to see video games – and play with and around videogames – as a particularly vivid and relatively new instantiation of this continuity (10-11).

It is this top-level form of gameworld from which this study of Super Mario’s gameworld starts. The suggestion that gameworld is not limited to the digital representation of a world and all interface objects and actions within it is to suggest that gameworlds pervade our very culture and non-game interactions.
METHODOLOGY

My intention for this thesis is to assert the necessity for consistency in the use of the term “gameworld.” To this end, I develop and assert a topology of a prominent gameworld: that of the Super Mario series. This includes disambiguating different notions that have commonly been held in use of the term “gameworld” into a hierarchy of terms: gameworld, system gameworld, and diegetic world. I design this topology on theorizations of gameworld by Seth Giddings in *Gameworlds: Virtual Media and Children’s Everyday Play* and Kristine Jørgensen in *Gameworld Interfaces*.

I use forms of game analysis, a method which requires much deliberation which is included in this section, on a carefully selected set of games in the Super Mario series. I borrow sensibilities from the case study method to inform the selection of games. From this, my hopes are that the selection of games themselves will reveal insights into how videogames build gameworld. However, this study does not draw specifically from a specific methodology. Rather, I position myself as a *bricoleur*, as one whose process of completing a task makes do with resources and intellectual tools as available and appropriate, as opposed to following rigidly set guidelines, as would, say, an engineer (Lévi-Strauss 17). In this section, I will outline the set of ideas that inform how I study the presentation of gameworld, the set of games to be analyzed for this study, and the process of analysis.

**Segmentation and Desegmentation of Gameworld**

What I call *segmentation* and *desegmentation* are terms I’ve designated to describe the form of a gameworld and the process of analyzing one. I hold that the gameworld of a videogame is fundamentally segmented across the games and materials that constitute it. In *How
In his book *To Do Things with Videogames*, Ian Bogost sought to analyze the effects of the medium of videogames across a range of topics germane to human culture (such as art and work), treating the medium as what he called a “media microecology” (7). I treat a single gameworld in this same spirit. I aim to investigate the gameworld of the Super Mario series, starting with an understanding of how the games themselves are situated within the gameworld. The process of coming to understand a gameworld by analyzing how it is segmented is a process I am calling desegmentation.

**Gameworld**

Seth Giddings starts his study of gameworld in the common way games scholars (not exclusive to videogames) have: in reference to “the magic circle.” This term is rooted in John Huizinga’s treatment of Hindu scripture in which a circle is ritually drawn to designate holy ground for playing games (57). It refers to the time and space designated for a nonintuitive set of rules to structure behavior around the playing of a game, whether it be the boundaries of a basketball court, the board on which *Monopoly* is played, or the virtual 3-dimensional spaces of a popular MMORPG like *World of Warcraft*.

Giddings only uses this as a starting point for defining gameworld. His employment of the term is transmedial – it is not limited to videogames or the time and space designated for playing a game, but includes “the imaginary spaces of children’s literature and the everyday fabrication of paracosms” that preserve their continuity throughout various forms of media (10-11). In this way, a gameworld is not limited to the space occupied in playing a game; it, rather, includes the many forms of engagement with that space that extend far beyond it. The working definition of “gameworld” in context of videogames that will be used throughout this study then
will be *the gestalt of all symbolic associations rooted in engagement with the contents of a particular videogame*. Our definition includes all segments that constitute the gameworld, whether it be multiple games in a series or sets of non-game retail products (such as novelty t-shirts) inspired by it.

As discussed in the introduction, this definition of gameworld is in conflict with other uses of the term. By “gameworld,” other scholars have meant the virtual navigable space in the game software and the fictional world being represented by it. While these are both certainly parts, or segments, of the gameworld, these two notions, both in themselves and as a pair, are unfit to signify with “gameworld.” Respectively, I’ve termed them the *system gameworld* and *diegetic world*.

**System Gameworld**

The *system gameworld* refers to the navigable virtual space within game software. This includes all the game’s contents and the interface (hardware and software) used to interact with them. This will be in use interchangeably with *videogame, game, system, game system,* and *system interface*.

This study takes the position, first asserted by Kristine Jørgensen, that game studies should dispense of the artificial boundary between a system’s content and its interface and move toward an understanding of what she calls “gameworld interfaces.” Her definition of “gameworlds” is “world representations designed with a particular gameplay in mind and characterized by game-system information that enables meaningful player interaction” (3). Her definition of “interface” draws from user interface design and human-computer interaction, arguing that it is the part of a computer system dedicated to affording user interaction with it (3).
She argues that there is no part of the virtual environment of a game system or of its audiovisual output that is not simultaneously both part of the gameworld and the interface. Her fundamental claim is that all game system information in all its presentations, be it textual information within an overlaid HUD or 3D graphics in a virtual environment, is part of the system gameworld. This conclusion follows her observation that overlaid information gives players vital information that inform how they should interact with the virtual environment, and that 3D graphics in a virtual environment, like trees and non-playing characters, provide information about what types of interactions and events they can expect. She builds this idea in the term “gameworld interfaces.” This study agrees with the assertion, but revises the terminology slightly from “gameworld interface” to system gameworld interface.

According to Jørgensen, “The claim that interface and gameworld merge means that system output and game environment must be understood as a continuation of each other, even when the system output is represented in a way that seems to break with fictional coherence” (6). This study agrees with her stance about the merging of interface and game content, but her use of “gameworld” in this quote is exactly what this study resists. By limiting gameworld to the contents of a single system, she overlooks that the contents of a single system use symbolic representations, such as Mario’s red cap, mustache, and overalls, that are rooted in other games. Though she makes a vital conceptual leap in identifying that games themselves are interfaces, she limits what is being interfaced to the game itself. This study argues that the notion of system gameworld interface makes apparent not only that a system gameworld interfaces players to the game itself, but to the wider gameworld (in the way Giddings uses the term).
Finally, Jørgensen’s use of “gameworld” conflates the representations with what is being represented. In Saussurian semiotics, this would be a conflation of a visual signifier, the visual representations in digital graphics, with its signified (Saussure 67). This is a problem because it fails to acknowledge the production of signs outside of engagement with the system. When Mario is designed as a 3-dimensional graphic in Super Mario 64, it is reductive to limit the signified of this graphic to Mario as he exists in this game; rather, it is one artifactual instantiation of a fictional character, Mario, who is visually represented in many ways across a wide range of games.

Diegetic World

Diegetic World refers to the fictional world that comes to be represented by the space, span of time, and set of events represented or simulated by the game. The notion comes from the works of Plato, who identifies diegesis as the types of storytelling in which a narrator explains events, as opposed to processes of mimesis in which the storyteller mimics such events such as through dialogue (“Diegesis”). The diegetic world refers to the signified, conceptual world being represented through the telling of a story or being represented by events in a system gameworld.

Games as Layered System Architectures

In the presentation of my research, I have conceptually modeled segments of the system gameworld into “layers,” unique levels of abstraction of a videogame’s system hierarchy. Such terms include the “selection screen layer,” “map screen layer,” and “action screen layer.” In computer science, one of the uses of the term layer refers to a level of abstraction within a hierarchical conceptual model of a computing device, computers themselves having been
referred to as a “series of levels” (Tenenbaum 8). I label my levels of abstraction in my game analyses as layers to conceptually model the system gameworlds in this way.

I derive this terminology from the description of software as a “layered system;” the notion of a layered system itself derives from the notion of software architecture. The purpose of invoking this terminology is to preserve our understanding that videogames are fundamentally pieces of software. Before they can be considered in terms of interactions that afford gameplay, storytelling, and the many forms of experience afforded by the medium of videogames, they should be understood as computer programs.

By labelling them as layers, the terminology also accomplishes extending the philosophy behind layered systems as a form of system architecture. Software architecture research sought to center research and design on the principle that algorithms and data structures should underlie some kind of system structure (Garlan and Shaw 2). The different forms of system structures came to be described as “architectural styles,” a “layered system” being one such architectural style (11).

Each layer is a collection of discrete elements with a common set of behaviors that together form a unique layer of abstraction. The concept of layer then contains three dominant notions – (1) that each layer is itself composed of multiple discrete units, (2) that each element within the layer is grouped into the same tier of abstraction, and (3) that discrete segments of each layer carry out functions that always must be understood in relation to the system gameworld’s other layers.

Finally, using this terminology helps in moving beyond the ludology vs. narratology fiasco and work in light of Ian Bogost’s notion of procedural rhetoric as outlined in *Persuasive*.
Games. From the ashes of the ludology/narratology debate, Bogost offered the notion that games are fundamentally a computational medium, and computation itself is a medium of computational processes – procedural rhetoric offers the notion that processes are a type of rhetoric used to persuasively instantiate its own processes, and analyzing these computational processes are fundamental to studying the medium of games (28-29). Game studies research may never fully recover from the reductive dichotomy drawn between gameplay and narrative, more recently described as a dialectic (Kapell). However, the wide use of procedural rhetoric in game analysis is a promising sign that game studies scholarship is moving toward grounding its research in the medium’s form.

Game Analysis

Here I will discuss the stances that build my theoretical framework for conducting game analysis. This is (1) to maintain the critical distance required to separate gameplay as entertainment from gameplay as critical analysis and (2) to take an operational stance in key theoretical debates for the purpose of conducting research.

Games for Analysis

By focusing on a single, robust game series, this study strengthens the theory of gameworld that would include all games of a single series within a single gameworld. As the Super Mario series includes over twenty games across multiple home and handheld consoles, it is far beyond the scope of this thesis to contain the entirety of the gameworld within this study. Rather, the study will focus on two separate analyses – one is an in depth study of the system gameworld of Super Mario World (Chapter 4), the second is a comparative analysis of five games of the series across two platforms: Super Mario Bros., Super Mario Bros. 2, Super Mario
Bros. 3, Super Mario World, and Super Mario World 2: Yoshi's Island (Chapter 5). As will be outlined later, the fundamental units of analysis will be the games’ techniques of segmentation.

The Problem of Play

Perhaps the most salient problem of using gameplay as a means to analyze games is that a single game can engage a diverse range of player types, as indicated by the research of Richard Bartle (“Hearts, Clubs, Diamonds, Spades”). To this end, how gameplay is employed in analysis directly correlates to the shape of the results of analysis. Though games certainly impose game goals on players, many types of players exploit design choices to advance their own player defined goals. In a multiplayer racing game like Mario Kart 64, an example of a player defined game goal that deviates from system designed game goals is if I were to pester one particular player by focusing offensive strategies on that particular player instead of strategically attacking enemies ahead of me to finish the race in first place. If I wanted to conduct an analysis of Mario Kart 64, the results of that analysis would be different if I were to take on such a player defined goal, annoying my friend, as opposed to the system defined goal, winning the race.

To recount Miguel Sicart’s problem with the proceduralist conception of games, “Much like Enlightenment, then, proceduralism is a determinist, perhaps even totalitarian approach to play; an approach that defines the action prior to its existence, and denies the importance of anything that was not determined before the act of play, in the system design of the game.” Certainly, in a spectrum of games research from the procedural to player-centric, my approach to gameworld leans procedural. My goal is to move beyond my own impression of the game and my personal play style under normal circumstances of gameplay to gain an understanding, through careful game analysis, of how such fundamental elements of the medium of videogames,
such as spatial segmentation or 2-dimension cardinality, work together to construct the system interface. The emphasis is not on identifying formal properties of games as an essentialist reduction of games to these properties, but rather to understand how such properties work together to build the system.

Iterative Game Analysis

I will use FCEUX, a NES emulator, to run ROMs, Read-Only Memory files, of the three NES games, *Super Mario Bros. 1-3. Super Mario World* and *Super Mario World 2: Yoshi’s Island* will be played on ZSNES, a SNES emulator. One of the functions of these emulators that I make much use of in my analysis is the “save state” function. This function saves the state of all system information at the moment the save state key is pressed. A different key loads that state when pressed and allows players to resume gameplay from the exact state the system was in when they saved it. I use this to interrogate particular system behaviors, especially in regards to how the system navigates between discrete spaces of the software. I have termed this process “iterative game analysis,” as it allows for iterative investigation of system properties through repeatedly loading a single state of the system for investigating the effects of different actions.

Comparative Analysis

Comparative analysis is used to understand how the five games of the Super Mario series under analysis utilize similar techniques to construct their respective system gameworlds. The particular aim of this form of inquiry is how each system constructs their own system gameworlds, how each of these systems relate to each other, and how this functions in the construction of the series’ gameworld.

Game Analysis
The process of game analysis that I will use does not rely on any particular model of game analysis, but rather will draw from the many analytic tools that have been developed in the literature around game analysis as needed in exploring certain experiences and properties of games during the process of my own analysis. In other words, I will start with gameplay, and expand my research to materials outside of the game as guided by questions and considerations that emerge during the process of gameplay and analysis.

**Terms of Analysis**

Because game analysis has been employed by researchers from a wide range of disciplines, it is necessary for researchers to work toward building a common set of analytic tools. I will employ a number of concepts outlined by the “Game Ontology Project,” (GOP) which offers “a hierarchy of concepts abstracted from an analysis of many specific games” (“Main Page”). By doing so, I aim to further entrench this set of concepts as analytical tools and to maximize precision in my analysis, though ultimately the presentation of my research will stay within the bounds of the “layered system” metaphor.

While I find the concepts and their definitions as outlined by the GOP strengthen the research I am offering, this set of terms is also guilty of describing many of its terms in relation to the gameworld without effectively defining what exactly the gameworld is. Their use of it is the very use that this study resists, what I have been describing as the system gameworld, and I will revise terms I borrow from them as appropriate.

**Discrete and Continuous Space**

The first set of tools I employ include discrete and continuous game spaces (Fernández-Vara, et al. 2-3). These two terms should be understood as a dichotomy of how the space of the
game system relates to the screen. “Discrete game space” refers to when the graphic elements rendered on a monitor that represent the setting of a game are contained within a single screen. “Continuous game space” refers to when those graphic elements that represent the setting extend beyond the screen, and techniques of scrolling, camera control, and other such interface elements are introduced to give players the ability to navigate the space.

*Cardinality and Representation of Space*

Another set of tools I use are cardinality of gameworld, cardinality of gameplay, and spatial representation (Fernández-Vara, et al. 2). These are important for understanding how a game uses the screen to represent space and the effects of interaction within that space.

The cardinality of gameplay refers to the axes of available movement of the player-avatar: 1-dimensional gameplay cardinality allows movement along one axis, such as the x-axis movement in *Space Invaders*; 2-dimensional gameplay cardinality allows movement along two axes, such as the x-axis movement through running and y-axis movement through jumping on and falling from platforms in *Super Mario Bros.*; 3-dimensional gameplay cardinality allows movement along three axes, such as the x-axis and z-axis movement through running and y-axis movement through jumping and falling in *Super Mario 64*.

Cardinality of gameworld refers to the dimensions of navigation through the game space. The GOP offers no definition for 1-dimensional gameworld cardinality. A 2-dimensional gameworld is one in which navigation of the game space is in two dimensions, such as in early arcade games like *Pac-Man*. A 3-dimensional gameworld is one in which navigation of the game space is in three dimensions, such as in many first-person shooters like *Halo*.
Spatial representation refers to graphical elements used to aesthetically represent space, but not necessarily to the effect of adding another dimension of gameplay or gameworld. For example, *Super Mario World* uses parallax for two layers of the background, which means the two graphical layers (not to be confused with the system layers described in the previous section) that make up the background and foreground scroll at varied rates as the player-avatar moves through the level. This makes for a dynamic representation of space, as if the gameworld space were 3-dimensional, though both cardinality of gameworld and gameplay are 2-dimensional.

**Techniques of Segmentation**

Another important set of terms I use, offered by the same researchers, are the terms that deal with segmentation. The term “segmentation of gameplay” refers to “how a game is broken down into smaller or shorter units of gameplay” (Zagal, et al. 178). There are many techniques that are used from genre-to-genre and game-to-game. For the purposes of this study, I will focus on segmentation of gameplay (gameplay segmentation), segmentation of time (temporal segmentation), segmentation of space (spatial segmentation), segmentation of challenge (challenge segmentation), and segmentation of narrative (narrative segmentation).

Gameplay segmentation refers to techniques used to chunk gameplay into manageable units. By studying a game’s techniques of gameplay segmentation, the processes of analysis and interpretation work in harmony with the form of the videogame itself. Of course, techniques of segmentation are not exclusive to videogames, and research has benefited from the study of segmentation techniques in other forms of media. Such techniques among other forms of media include the segmentation of novels into chapters; the segmentation of movies into scenes; the segmentation of visual aids in presentations into slides; the segmentation of academic research
into introduction/literature review/methodology/chapters/conclusion, etc. These techniques of segmentation make for more robust interaction with the media, and researchers must include an analysis of these systems of segmentation in the course of analytic research.

Temporal segmentation refers to techniques used to manage time during gameplay. It manifests in two forms: time as coordination, such as in turn-taking, or time as a resource, such as an imposed time limit (Zagal, et al. 179). One of the primary terms I use in presenting my analysis of temporal segmentation is the infinite loop. The infinite loop is a machine state in which the same set of animations and sound files play indefinitely until player interaction advances the system to the next state. An example of the infinite loop is the gameplay demonstration that plays when the system is left idle in *Super Mario Bros.* and *Super Mario World*. Throughout this study, I will introduce other terms and identify them as a type of temporal segmentation where appropriate.

Spatial segmentation refers to techniques used to constrain and afford interactions with discrete and continuous gamespaces in relation to the screen. One of the most prominent units of spatial segmentation, and the most pertinent to this study, is the level, “a recognizable subspace of the gameworld” (the system gameworld, in our current understanding of the term) (Zagal, et al. 182). As we will see later in the analysis chapters, a single level is an intersection of many methods of segmentation, but suffice it for now to say it functions as a technique to segment space. Another important term is the “spatial checkpoint,” a “sublocation” within the level where the player-avatar, once the checkpoint is reached, will spawn upon re-entering the level after it is forcibly terminated upon a specific event often referred to as “dying” in platform games (Zagal, et al. 184-185).
The definition of challenge segmentation that Zagal, et al. offer is this: “segmenting by challenge is to have the player resolve a series of discrete self-contained challenging situations, their most salient feature being that they are perceived by the player as separate tests or trials. Specific forms of challenge segmentation include puzzles, boss challenges, and waves” (187). The level in all five games under analysis in this study should be understood as both a segmentation of space and challenge – especially because all five games make use of the boss challenge technique of challenge segmentation, and four of them make use of the bonus stage technique of challenge segmentation.

Narrative segmentation refers to “Dividing gameplay to put it at the service of the storyline of a game” (“Narrative Segmentation”). The element page of the GOP treats it in terms of the way games can be structured as “Acts” or “Episodes” in the way TV series or theater performances can be segmented. However, I will be treating narrative segmentation more generally in terms of the gameworld, extracting narrative elements not just from the game software, but supplemental materials included with the game packaging – game manuals. The primary elements in the game software in terms of narrative segmentation include cutscenes and transition techniques used in navigation between discrete game spaces.

The Game Ontology Project is organized by four top-level elements as parent elements, and these are all further broken down into child elements. Temporal segmentation, spatial segmentation, challenge segmentation, and narrative segmentation are all categorized as child elements of gameplay segmentation, which is itself a child element of gameplay rules, which is a child element of rules, one of four top-level elements. If I were to revise this model, I would include Gameworld as a top-level element, and categorize gameplay, temporal, spatial,
challenge, and narrative segmentation as child elements. However, the purpose of using terms from the Game Ontology Project is the precision they facilitate in analysis. I resist the hierarchical assertions made by the GOP, but make use of the conceptual tools offered. In the next section, I begin the work of forming my own hierarchy of system elements starting from Gameworld.

_interface Metaphor_

Veering away from the GOP, I will also make use of the term interface metaphor. And interface metaphor is the grounding of user interface interactions in familiar conceptual frameworks (Neale and Carroll 441). This theory of interface design followed the emergence of direct manipulation, an “object-action” model in which “interface objects” can be directly acted upon through available methods of input, or “interface actions” (Schneiderman 98-99). Throughout this study, I will use the interface design metaphor as a conceptual tool for investigating how audiovisual outputs of and interactions with system gameworlds are associated with the gameworld and diegetic world. Especially because part of the aim of this research is to strengthen Jørgensen’s claim that the system itself is an interface, the interface metaphor may be the most divisive tool used in my analysis and presentation.
DESEGMENTING SUPER MARIO WORLD

Super Mario World (Nintendo, 1990), released in the U.S. in 1990, is among the most iconic games designed for the Super Nintendo Entertainment System (SNES) console. It was so popular in part because it was one of the two launch titles available at time of release, but also because it was a highly anticipated installment of the already popular Super Mario series (Arsenault, Chapter 4 “Beyond Bits and Pixels: Inside the Technology”).

The second home console game system designed by Nintendo, the SNES was equipped with a relatively modest hardware setup (even for the time period’s standards), using a 16-bit Ricoh 5A22 CPU linked with a 16-bit pixel processing unit (PPU) and an 8 channel stereo audio processing unit (APU) (Arsenault, Chapter 4 “Beyond Bits and Pixels: Inside the Technology”). These hardware choices were on one hand a way of competing with Sega and other computing platforms for games, but on the other hand a way of further developing the genres they profited from most – the side scrolling platform game and the action-adventure game.

Arsenault, throughout his book Super Power, Spoony Bards, and Silverware: The Super Nintendo Entertainment System, argues that the SNES was the first console that led to a major decline in Nintendo’s hold on the home console market, as competitors Sony and Microsoft entered the industry with their Playstation and Xbox. Nintendo undeniably continues to make modest choices for the processing power in their consoles, and yet their hold on the market persists. Following the Wii U, a release many consider to be a major flop, their most recent console at time of writing the Nintendo Switch has been met with great critical acclaim and commercial success. This is especially puzzling in a marketplace where their competitors meet
the high consumer demand for photorealistic graphics and open 3D system gameworlds which tax system memory and processors greatly.

The insight I hope to provide is that one of the reasons Nintendo foregoes taking on the cost of processing power could be that the robust gameworlds that they offer build on a different set of conceptual and perceptual relations. As argued previously, the gameworld is not limited to the elements of the system gameworld encoded in a cartridge’s disk storage, but includes all symbolic associations built from games in the series. We can present the guiding questions of this chapter as such: How did *Super Mario World* organize its own system gameworld? How did this lend itself to a more robust gameworld that continues to drive Nintendo’s success?

To answer these questions, I will apply the many analytic tools offered by recent game studies scholarship, such as Ian Bogost’s theory of procedural rhetoric, Kristine Jørgensen’s theory of gameworld interfaces, and Clara Fernández-Vara’s game analysis methods. I will first explain how *Super Mario World*’s system gameworld is built as an arrangement of software layers, transitions, and procedures. I will then explain how these aid in building the gameworld by applying Jorgensen’s gameworld interfaces theory. Finally, I will speculate how this game facilitated the continued success of the Super Mario series in an analysis of the game’s defining feature – the map screen.

**Layers of *Super Mario World***

To organize and adequately discuss the many system components of *Super Mario World*, I will be treating three identifiable layers of abstraction in the game as discussed in the methodology section: the selection screen layer, the map screen layer, and the action screen layer. The game manuals of the Super Mario series offer instructions to operate the game by
referring to certain states of the game as a “screen:” the demo screen, the map screen, the action screen, etc. I’ve kept this language in grouping the many elements within a common set of screens into a single layer to maintain the language within the game manual. And as mentioned in the methodology section, the term “layer” is used to abstract a set of discrete spaces with common interface elements as a grouping. In this way, the “screen” part of the term should be understood to aid the presentation of my findings of the specific games being studied in this research, not necessarily a theoretical framework for future presentations of analysis. However, future research in games that underlie a similar set of interface principles would benefit from the layers framework of presentation.

The selection screen layer includes all states of the system before it transitions to either the cutscene that initiates a new game, or the state of the map screen layer immediately before the save file’s most recent save. It contains three major segments: (1) the opening credit, (2) the demo screen, and (3) the selection screen. This layer is the site of three vital system functions: demonstration of gameplay, selection and management of save file data, and selection of play mode. Once players select a save file and play mode, they cannot return to this layer unless they reset the whole system.

The map screen layer sits between the selection screen layer and the action screen layer. It is composed of discrete spaces on which icons representing selectable levels of play must be navigated between using the directional buttons on the controller, moving Mario, the player-avatar. The system loops through sprite animations and short music sequences, making for an active space that runs indefinitely, awaiting player input. This layer carries out several vital functions: abstracting the level architecture of the game, representing progress through the game,
allowing for navigation between unlocked levels, and situating all interactions with the system gameworld within the diegetic gameworld. As I will expand on later, this is the layer most germane to this study because of its interface metaphor – a world map of the fictional world Dinosaur Land.

The action screen layer is perhaps the most challenged notion within this model of the game. The action screen layer refers to the game space entered when players make a selection on the map screen layer. It is in this space that players engage in a classic race-to-the-finish style game, overcoming obstacles such as the time limit and projectiles thrown by enemy sprites.

This is slightly troublesome especially because I also make heavy use of the term “level,” a term that is used to refer to the site of gameplay and already itself suggests vertical organization. These two terms are not in conflict in the context I am using them because here, the action screen layer is used to describe an abstraction of all the levels in unison – underlying this system of organization is that all the levels in their unison are taking place within the same diegetic world, that levels themselves are segments of the diegetic world. The action screen layer refers to this in an abstracted way, removing the particularities of the diegetic world, gameworld, and elements of gameplay/game goals from the software system that underlies them.

This model of layers gives us a way of discussing the game system outside the context of gameplay, space, time, challenge, and narrative. It affords treating the software architecture of the game as a form unto itself, and allows for more careful speculation of how this contributes to the construction of the system gameworld, diegetic world, and ultimately the gameworld itself.
Transitions

As previously mentioned, one of the main jobs the system handles is presenting the system gameworld in segments. Making manageable the many forms of segmentation in the game is one of the main purposes behind organizing various system elements, properties, and functions into a system of layers.

To manage the fragmented presentation of the world, the system uses different techniques of transition and the imposed continuity between segments that affords the interpretation that all actions take place within a cohesive world. As we will see, the system uses combined techniques of film transition and digital animation to afford an impression of continuity as the system closes one screen and opens another, moving between discrete screens of the map screen layer or between the map screen layer and a level.

Hardware to Software Transition

![Figure 3.1 Opening Credit Screen.](Super Mario World)

The first transition, we would be remissed not to include and identify as a transition, is the opening sequence of the game. Upon successfully connecting the console to power and the TV, the cartridge and controller to the console, and flipping the power switch to turn the system on, the game software opens with a startling chime and opening credit (Fig 3.1). The chime is a coin drop, an echo of the quarter-driven public ritual that Nintendo was ushering into the home.
(in a fit of postmodern self-parody, that sound becomes a staple of gameplay as Mario vacuums up all the coins he can find on each level). After a few moments, the system cinematically fades the opening credit screen to black. From this black background, the title screen fades in cinematically. The title screen is pointedly low-tech — with its awkward wooden frame and a title blocked out in a multicolor typeface that recalls nothing so much as the graffitied covers of children’s notebooks. And again, the copyright on the bottom is a reminder to players just who it is they can thank for the experience they will have. From the center of the screen, a small hole appears and expands to expose the background of one of the game’s playable levels (Fig 3.2). Mario and a common enemy sprite, the koopa, flash on screen and an animated demonstration of gameplay commences. Minus the opening credit, the system loops this sequence indefinitely

![Figure 3.2 Title Screen Iris Shot. (Super Mario World).](image)

until the player advances the system to the selection screen.

This opening sequence is a remediation of two techniques in film production – the opening credit and title sequence. The opening credit, a technique common in film and television, is used to attribute the production to its contributors, sometimes implemented
creatively but nonetheless is a convention of function (Crawford 60). Title sequences are techniques of displaying the title of the film in text on screen, whether as part of an opening credit sequence or within a scene of the film itself, that transitions viewers into the movie space (Stanitzek 44). The title sequence itself stands at the border between being part of the film and separated from the film, creating a “divided focus of attention, the separation of the inside from the outside, of what is the play of the narrative from what is documenting the production, cinematic narrative from film commentary, intradiegetic from extradiegetic information” (Stanitzek 45). It cues viewers that they are to move their attention from the real world to the film – a form of transition in itself.

**Cutscene Transitions**

The cutscene is a narrative convention in games, a non-interactive, cinematic scene that segments scenes of interaction (Perron 80-81). It has been described as a method of situating scenes of play, rewarding achievements of game goals, mapping progress through the game by representing it narratively, and has even been suggested as the core of the game by those who would argue videogames are a storytelling medium (Klevjer 193-197). However, in my model, I will be describing them as transitions, in the same way I am treating the other remediations of film. Certainly, they carry the functions of segmentation and other mentioned effects, but in form, they are a method of transition.

In *Super Mario World*, cutscenes typically take the form of a screen divided roughly in half between text, often being rendered character by character, and a digitally animated scene. The animations are most of the time a combination between an animation in the cutscene screen and a series of state changes to icons on the map screen layer. There are three types of cutscenes
that follow distinct game events: starting a new game, beating a boss challenge, and beating the game.

On selecting a previously played game on the selection screen, the system uses fade transitions to switch the screen to the map screen layer. But on a new game, in addition to the fade, a blurring transition is used, making use of the low-resolution graphics of the game to produce an effect of amorphous blocks of pixels. The background fade-blurs in, Mario standing in the foreground, and from the center of the screen, a black text box expands from the center and the text of the message suddenly appears (Fig 3.3). The fade/blur transition is accompanied by a triumphant tune to create the tone that the player is going on a journey. The text coaxes the player, “Welcome! This is Dinosaur Land. In this strange land we find that Princess Toadstool is missing again! Looks like Bowser is at it again!” The playful, chiding tone of “Bowser is at it again!” creates the impression of a world that has persisted before the player’s engagement with the system, that Bowser has been at it before, and that the situation is so common that the player should already be familiar with this. Beyond this, it introduces the setting, Dinosaur Land, and the two most important characters beyond Mario (and Luigi if in two player mode): Princess Peach and Bowser, Princess Peach being the damsel in distress and Bowser being the villain. When the player advances the system to the next state, a short digital animation of Mario

Figure 3.3 New Game Cutscene. (Super Mario World).
walking to the first selectable level of the game on the map screen layer is played before giving
control to the player. This cutscene serves as a transition from the computational task of selecting
a new game data file to the system gameworld, a site that melds computational tasks, cinematic
cutscenes, and gameplay all situated within a fictional world.

The boss challenge cutscene follows the player achieving the game goal of the castle
levels (Fig 3.4). Once the player has defeated the boss of the level, the system transitions to the

digital
animation
plays
in
which
Mario,
by
some
method,
destroys
the
castle
and
stands
aside
while
the
victorious

tune
from
the
start
of
the
game
plays
and
text
renders
in
the
bottom
portion
of
the
screen.
The
text
is
generally
to
the
effect
of
maintaining
the
narrative
that
Mario
is
working
through
the
treacherous
areas
of
Dinosaur
Land,
taking
on
Bowser’s
adversaries
who
aided
in
the

Figure 3.4 Boss Challenge Cutscene. (Super Mario World).
capture of Yoshis and Princess Peach and taking over Dinosaur Land. These cutscenes are used to transition players from one world, in which beating the castle is the most important task, to the next world.

Figure 3.5.1 Final Cutscene #1. (Super Mario World).

The final cutscene of the game is a series of two cutscenes separated by the closing credits. Bowser flies into the background as the other bosses do, Mario and Peach come together, text renders against the black background of the scene, and fireworks go off as the screen fades to the rolling credits (Fig 3.5.1). During the running of the credits, Mario, Peach, Yoshi, and the baby Yoshis walk through all of Dinosaur Land back go Yoshi’s House, the first level of the game. After the credits run, in a parody of a style of credit to the starring roles of a film, the game presents all the enemy sprites, as if they are the “actors.” The scene that fades into the action screen layer of Yoshi’s House and eggs within the level hatch to reveal baby Yoshis (Fig 3.5.2). Finally, this fades to a screen with Mario, Luigi, and Princess Peach posed with text
reading “The End.” This cutscene transitions the player from the moment their gameplay ends to this final screen.

This set of cutscenes shows how narrative elements are used to transition the player between scenes and sites of interaction. The cutscenes themselves are digitally animated, if they’re animated at all, and tell the story through text. They signify progress and segment periods of time and interaction with the game – once a castle is beaten, the state of the map screen layer changes, and the state of the game is saved, in-game time has moved forward in the irreversible changes made to the map screen layer. To signal this change and this progress, the cutscene orients the events within the story of the game.

*The End*

While at once this is a remediation of the final screen of movies, because the medium of film does not run on any sort of loop but rather plays back a finite set of frames and audio, “The End” simply means there is no more video or audio content of significance afterward. In a videogame, though the sentiment is the same, in context of the medium, it is an assertion that there are no further activity spaces beyond the frame.

![Figure 3.6 The End Screen. (*Super Mario World*).](image)
Throughout the final cutscene, the system recognizes no inputs. The transition to the final screen cannot be skipped or sped up. After the cutscene finishes, the system does a fade transition to the final screen in which the text “The End” is centered underneath a still image of Peach standing between Mario and Luigi (Fig 3.6). When this screen is displayed, the system is completely resolved and no longer recognizes any inputs from the controller. The only possible input the player can make is to cut the power to the console by flipping the switch (or resetting it). In other words, the system cues the player to return to the real world, the hardware level of the game system, by ignoring all other possible inputs through the controller. The system will stay on that screen indefinitely – once the game is beaten, there is no means of transitioning to any other part of the game.

**Interlayer and Intralayer Transitions: Achievement, Failure, and Game Procedures**

Achievement and failure in a game are measured in relation to game goals which are made achievable explicitly in the action screen layer. Generally, when a player has met a game goal, such as reaching the end gate or finding a secret, the level ends and the map screen transforms, revealing new pathways. However, within the action screen layer, the player can fail in multiple ways, such as falling where there is no platform, colliding with an enemy, or allowing the timer to run to zero without having achieved one of the goals. Such events trigger their own sets of transitions which complete the circuits of navigation between the action screen and map screen layers, and between screens of the map screen layer. Because this is the most vital form of transition to understand before moving into a discussion of gameworld and gameworld interface, I will outline these transitions by roughly illustrating significant moments of gameplay. This section will synthesize many of the concepts we’ve been working with so far.
It will illustrate how this model of layers and transitions helps understand the manner in which the system gameworld manages to build a cohesive diegetic world.

**Interlayer Transitions**

To start a level, the player must select a level on the map screen layer. Once the level is selected, a short cutscene transition in which Mario raises his hand while the screen blur-fades out to black, a black screen reading “Mario Start!” flashes briefly, and then the level blur-fades in on the action screen layer, after which player-avatar Mario spawns, the timer starts to count down, and gameplay begins (Fig 3.7). This is one of the primary forms of an interlayer transition – from the map screen layer to the action screen layer. An interlayer transition manages the task of moving the player between two sites of interaction that differ in their layer of abstraction. Later, I will also discuss how the system manages interlayer transition from the action screen layer to the map screen layer.

![Figure 3.7 Level Start Sequence.](Super Mario World)
The most salient feature of the interlayer transition is that though it transitions the player between two different game spaces, both spaces represent the same diegetic space. On the map screen layer, the space is represented as an icon and text that labels it on the top margin of the screen. In the action screen layer, the space is represented as having characteristics that make gameplay possible – animations that represent actions like walking and jumping, events that represent the effects of those actions like collisions. The interlayer transition manages the task of moving players from one representation of a diegetic space to another representation of the same diegetic space.

This is a key moment in our analysis, because it exemplifies why current uses of the term “gameworld” fall short. If we use the same term to simultaneously refer to navigable interaction spaces and the elements of diegesis being represented by those spaces, it obscures one of the major computational processes that makes possible the interpretation that there is a cohesive world within the software. It is the abstraction of the diegetic space in two different layers that affords the game’s system of navigating between levels. This will become more clear in the next chapter when we compare this to other methods of segmentation used in other games of the Super Mario series.
Intralayer Transitions

Intralayer transitions are transitions that move a player from two interaction spaces that are both in the same layer. Yoshi’s Island 2’s level design contains an underground area accessible through a pipe. A blur-fade transition follows the animation of the player-avatar being sucked in through the pipe. After a brief pause, the screen blur-fades in, revealing a differently designed space of the level, looking like underground caverns. From above ground to underground, from the ground to clouds in the sky, the movement between distinct spaces of a level is handled using cinematically inspired transitions to represent persistence of the diegetic world (Fig 3.8).

Figure 3.8 Intralayer Pipe Transition. (Super Mario World).

This notion is perhaps the reason “gameworld” has been used so haphazardly. Perhaps researchers have fallen for the effects of design choices that would mask the segmentation of the
system gameworld. Regardless, it is a habit that must be dispensed in place of the nuanced notion of gameworld I am proposing throughout this study.

*Interlayer Failure Transition*

Actions within the action screen layer and events that trigger a transition from the action screen layer to the map screen layer are always in context of achievement and failure due to the design of game goals. How much players adhere to game goals is always a choice made by the player. However, no matter how they choose to interact with the game software, they always must do so relative to the rules of the game software, unless the game has been modded or hacked for different forms of engagement.

The action screen layer all but forces the player out – while the map screen layer will continue to loop animations and music indefinitely, the player’s engagement with the action screen layer is always at the very least constrained by the timer. Once the timer reaches zero, the system forces a transition to the map screen layer. This is one of many ways the player can “lose” or “die,” terms used to describe when a player has failed to meet game goals and have been forced out of the space for gameplay. In addition to time, each level contains various obstacles, whether they require precision in jumping across platforms or moving beyond enemy sprites that will destroy Mario upon contact. The gameplay then is characterized by imposing a game goal – reaching the end gate of the level – and imposing challenges to achieving the game goal.
In each case the player is unable to overcome a challenge – be it falling through a gap in platforms, failing to achieve a game goal before the time runs out, or colliding with an enemy – the system triggers a cutscene transition (Fig 3.9). The system’s frame freezes all movement in the level, including scrolling and enemy movement. Mario’s sprite faces outward, his face red with shame and tears. The sprite falls downward offscreen as a taunting, chiding tune plays, after which fade transitions are used to force the player from the action screen layer to the map screen layer. In the case Mario is offscreen, the same sequence plays with the exception of Mario’s sprite transformation and animation. Upon re-entering the level, the player starts at the beginning of the level or a mid-way checkpoint if it had been reached.

![Figure 3.9 Failure. (Super Mario World).](image)

The failure transition makes strategic use of the two-layered representation of one diegetic space. When the player fails to achieve a goal in action screen layer of the level, they return to the map screen layer which remains as it was before they entered. The level cannot be passed until a game goal has been achieved, and so the player is motivated to re-enter the level and become more familiar with the space to overcome its challenges. Through repeated failures, the player is able to gain competence in operating the system and achieve the game goal. By chiding the player as they fail and designing gameplay around the principle that the player must
start from the beginning, the effect is that while the player is learning to overcome the challenges of the level and reach a game goal, diegetically, Mario is traversing the areas of Dinosaur Land.

*Interlayer Achievement Transitions*

Anytime a player achieves a game goal within a level for the first time, a state change in the map screen layer is triggered. In a new game state, only three levels are made available, one of which, Yoshi’s House, is not a site of gameplay in itself, but an action layer representation of the home of an in-game character. By beating either Yoshi’s Island 1 or Yoshi’s Island 2, the player is able to change the state of the map screen, opening a path to a new level. In other words, when the player has successfully overcome the challenges of the level and reached a game goal, diegetically, Mario has traversed an area of Dinosaur Land.

There are four types of game goals: reaching the end gate, finding a secret, beating a boss challenge, and pressing a switch. Reaching an end gate and finding a secret trigger the same type of interlayer transition, but pressing a switch and beating a boss challenge present unique types of transition.

The switch palace is a specific type of level with its own game goal – pressing a switch. Within it, the player must navigate Mario to the end of the level and pound a switch of a particular color. Once the level is beaten, spawns block sprites of that certain color in the action screen layer across the whole game. Beating a switch palace never changes the state of the map screen layer, but rather changes the state of the action screen layer and opens access to finding secrets, which do trigger state changes to the map screen layer. The achievement transition is handled by an in-action screen layer event (pounding on a switch) that triggers a textbox to appear and explain the state change to the action screen layer across the game to the player. The
system uses fade transitions back to the map screen layer, after which many sprites, representing
the colored blocks to later be found in the action screen layer, disperse from the icon
representing the palace in the map screen layer (Fig 3.10). The state of the switch icon itself
transforms from unpressed to pressed. This transition represents visually to the player the effects
that the in-game event of pressing the switch has on the action screen layer throughout the game.
The transition functions as a reward, a narrative event, and ultimately transitions the player from
one state of the action screen layer, in which in place of the blocks are outlines that Mario falls
through, to a new state, in which the blocks themselves replace the position of the outlines.

The boss challenge is another form of game goal designed for a specific level archetype –
castles and fortresses. Overcoming the challenge triggers the state change in the map screen of
the upheld castle or fortress to a debris pile with a white flag as well as the opening of a path to a
new level in the case of a fortress, to a new world in the case of a castle. In the gameworld and
interface section, we will see further how this supports specific types of experience in the map
screen layer. But for now, suffice it to say the transitions situate experiences of gameplay and
interaction within the diegetic world of the game, allowing for overcoming a boss challenge to
have felt like the castle was a barrier to moving to the next area.

Figure 3.10 Switch Palace Achievement Transition. Yellow blocks disperse from the switch
palace. (Super Mario World).
Almost every other level within the game presents one or more game goals characterized by either finding a secret or reaching the end gate. The end gate at first would appear to be the standard game goal, but later in the game this trend is subverted. The end gate is typically at the far right of a level and colliding with the gate triggers the same achievement any time the end gate is collided with. The animation consists of Mario walking past the end gate as a victorious tune plays, the screen fades to black, points count up, the screen fades back in to reveal the level, and then an iris-in transition is used to cut to the map screen layer (Fig 3.11). At this point, a series of animations take place in which a path is revealed to the next level – which level is determined by whether an end gate is reach or a secret is found. We will see later that the level architecture affords dynamic paths to be taken in pursuit of the primary game goal – defeating Bowser.

Figure 3.11 Level Completion Transition. This transition follows Mario beating the level Yoshi’s Island 2 (Super Mario World).
The Gameworld Interface of *Super Mario World*

By now, it should be apparent that the conceptual model of layers and transitions facilitates a much deeper analysis of how the system gameworld is constructed. The system gameworld is segmented in its relation to the TV screen and the system uses techniques of transition and navigation to represent a fundamentally segmented representation as a cohesive world. The final element we must address is how this fundamentally segmented system is interfaced. In the next section, we will see how this helps us understand the segmentation of the gameworld.

To do this, I will roughly illustrate key moments to understanding this system and how it is situated within the gameworld. Each layer is interfaced differently, making use of the same controller, and the way these inputs map to their audiovisual outputs make up the system gameworld interface. To reiterate how I draw from Jørgensen, the gameworld interface is a concept that argues that the entirety of the audiovisual output of the game system, not only the software and hardware interface, is an interface to game system information, which in itself is not readable or interpretable by a human. I’ve revised the term to system gameworld interface, interchangeable with system interface, and further arguing that the system interface also interfaces players to the gameworld, which is not limited to the information held within the videogame’s memory. Rather, it is the gestalt of all symbolic associations rooted in all the sociotechnical systems that have evolved from games within the Super Mario series. The interface of the game simultaneously interfaces players to the system information and the gameworld in its entirety.
Remediation in the Selection Screen Layer

The presentation of the whole selection screen layer borrows techniques from other mediums, namely typography, film, and the PC. Jay David Bolter and Richard Grusin refer to this technique, “the representation of one medium in another,” as remediation (45). This effect is not particular to videogames or even digital media more generally, although figuring out where some of the system’s elements and functions come from will aid our analysis of their functions within the system gameworld. The selection screen layer remediates techniques of film transition, typographic conventions, and UI elements to transition the player’s attention from the system hardware to a particular position within the software’s system gameworld – the top-level layer, or the selection screen layer.

The timed opening sequence, or the demo screen, borrows from the medium of cinema to make use of its methods of structuring audio/visual content. Such methods include the flashing opening credit screen, fade-in and fade-out transitions, the iris-in transition, and timing of the music. However, these film techniques are parodied to frame the opening credit and demonstration of gameplay, a function of the system, as the opening scene in a film or TV series. This can have multiple effects including facilitating players’ goal-setting (“I will reach that level and beat it”), modeling expert gameplaying (“This is an example of someone else’s elegant gameplaying”), and motivating players to become competent at operating the system (“I will have become an expert player when my handling of the system is as efficient as seen in this screen”). In effect, by framing the demonstration as a scene, this state of the selection screen layer functions as a site of potential, an interface both to the potential the player will soon be
operating the player-avatar Mario in the same way as demonstrated, and to the system that will make such operation possible.

The selection screen state of this layer remediates typographic and UI conventions to afford navigation between and selection of menu options (Fig 3.12). The three available save files of the system are represented textually in the first navigable menu as “Mario A,” “Mario B,” and “Mario C.” The data itself is represented textually as “empty” if the save file does not contain any data, or a number between 0-96 that numerically represents how many game goals have been achieved. The save file and representation of data are arranged on the same line, and the red cursor can be moved between the four lines of this menu using the controller. This arrangement of text makes use of typographic conventions, including margins, justified alignment, and leaders, which are “a series of characters—usually periods—that give the eye a path to follow from text to page number” (Felici “Chapter 14: Document Structures and Typographic Conventions” – “Structural Elements”). Leaders are typically found in the table of contents section of a book, but have been remediated here in service of the menu as a type of table of contents – the contents being a new game or the state of a previous play session. The blinking red cursor simultaneously remediates two conventions of the modern PC: the blinking

Figure 3.12 Selection Screen. (Super Mario World).
cursor, an innovation for identifying the position of the cursor in a text field, and the x-y position indicator, now commonly known as the mouse pointer (Kiesling; Engelbart).

Remediating these three elements of typography and PC UI design affords the selection screen layer to function as the top-level layer of the system. By borrowing the typographic convention of leaders, the selection screen layer functions as a table of contents to the contents of the three save files. By borrowing the conventions of the blinking cursor and the mouse pointer, the selection screen layer affords navigation and selection of menu options, similar to the UI elements of a PC. This is the only layer of the system in which the cursor is abstracted as a pointer instead of player-avatar Mario, and this effectively separates the selection screen from the diegetic world of the game. The selection screen is a layer for navigating between states of progress through the game from previous play sessions, and therefore always functions as an interface between players and state changes they’ve made to the other layers in previous play sessions.

Map Screen Layer and the Interface Metaphor

An interface metaphor is the grounding of user interface interactions in familiar conceptual frameworks (Neale and Carroll 441). This theory of interface design followed the emergence of direct manipulation, an “object-action” model in which “interface objects” can be directly acted upon through available methods of input, or “interface actions” (Schneiderman 98-99). If we humor the selection screen layer uses a table of contents interface metaphor by remediating typographic leaders, we can understand more distinctly how this layer functions as the top-level layer of the game – it is itself an interface to the content of the software without itself containing any content. If a person has only read the table of contents of a book, it would
not be appropriate to say that the person has read or is reading the book. Rather, the table of
contents can help the person find where in the book the content they would like to read is
located. Once they have turned to that page and begun reading, we can say that the person is now
reading the book. In the same way, in *SMW*, it is upon selecting a save file and entering the map
screen layer that the player is interacting with game content.

The interface metaphor of the map screen layer is the world map (Fig 3.13). The layer is
made up of the same basic contents as the selection screen layer – a cursor and navigable menu
options. The cursor, instead of a pointer, is player-avatar Mario, a digitally animated set of
sprites that represent fictional character Mario walking, marching in place when idle and walking
along paths when moving between menu options. The menu options themselves are also visually
abstracted as icons, which can be in the form of yellow or red jewels, a button, a fortress, a
castle, a cave, a haunted house, a pipe, or a star. The buttons, fortresses, and castles change state
once the game goal within those levels are achieved. In this way, as the player gains access to
new levels, simultaneously Mario is moving to new areas of Dinosaur Land.

The interface metaphor of the world map situates all interface actions, commonly
characterized as navigation, selection, and gameplay, within the diegetic world of the game.
Especially because it acts as a neutral or safe set of discrete game spaces from which the player
can make choices about what level they will play, the map screen layer carries the responsibility
of orienting the player. It segments gameplay into navigable levels which themselves are units of
gameplay, challenge, narrative, time, and space. The system is designed to map the physical
interaction with the interface, the player’s use of the controller, to the audiovisual output of the
map screen. It allows for the player to interpret meanings from the way their interactions change
the state of the map screen. In this way, it makes it possible to interpret that the movement of the
cursor along the screen from level to level is a model of a fictional character, Mario, navigating
through a fictional world, Dinosaur Land. The map screen layer interfaces players to the diegetic
world through the controller.

Resolving the System and System Interface Assertions

The player can come to know of the primary game goal in several ways. Most likely,
players would already be familiar with the game goal due to the prominence of the race-to-the-
finish style genre and the popularity of the Super Mario gameworld. But the system gameworld
takes precautions in the opening cutscene of a new game.
The software of the game system has one primary designed objective in code that resolves the system. The player must navigate from the position on the map screen layer that the system starts, Yoshi’s House, to the final level, Bowser’s Castle, and beat the boss challenge. In the game’s opening cutscene, the background fade-blurs in, Mario standing in the foreground, and from the center of the screen the black text box appears and the text of the message suddenly appears (Fig 3.3). The fade/blur transition is accompanied by a tune that creates the tone of anticipation, of the feeling a person may have before embarking on a lifechanging journey. While the music is playing, all input by the player is ignored by the system. Only after the music has stopped playing will A, B, X, Y, Start, or Select on the controller trigger a transition from this screen to the map screen. If no input is made, the system will remain in this state indefinitely. In other words, the system asserts the reading of the text on the screen and the listening of the entire sound file. The system demands the player to become familiar with it.

The text coaxes the player, “Welcome! This is Dinosaur Land. In this strange land we find that Princess Toadstool is missing again! Looks like Bowser is at it again!” The message implies that the scene is a common occurrence. It suggests the persistence of the series’ gameworld before players’ first interaction with the system. The playful, chiding tone of “Bowser is at it again!” entrenches this impression, and the notion that Bowser has been at it before asserts that the player should already be familiar with this. Beyond this, it introduces the name of the place we will be situated, Dinosaur Land, and the two most important characters: Princess Peach, the damsel in distress, and Bowser, the bad guy.

By remediating other medium’s methods of organization and using a map of the game’s diegetic world, the setting of the story’s events, as the interface metaphor, the game interfaces
players simultaneously to the game system information and to the gameworld. On one hand, the systems of segmentation and the interface for navigating between them affords players’ interactions to willfully move toward the system game goal and system resolution. But on the other hand, the system gameworld exists within a wider gameworld, and the game itself is an interface to this wider world.

**Segmentation of Gameworld**

By the release of the Super Nintendo Entertainment System console (Japan, 1990; US 1991), the stand-alone videogame console had already become a staple of many middle-class families’ home entertainment systems. A televised commercial for *SMW* describes the game as “A bit more exciting; a bit more challenging; a bit more graphic; a bit more colorful; a bit more realistic; a bit more levels; a bit more secrets; a bit more enemies” and so on. The repetition of “a bit more” contains two notions relevant for launching our understanding of the game’s gameworld: (1) the game is part of a series of games of which this game is just one installment, and (2) the double entendre of “bit” is not only a modifier to suggest that the game is a slight improvement to predecessors, but recalls the measure used to describe the CPU in home consoles. The SNES and its primary competitor, the Sega Genesis, both used a 16-bit processor, an upgrade from 8-bit processors in both companies’ previous consoles. By using this language in the marketing of the game, it entrenches the game’s content simultaneously within the Super Mario game series and the series of consoles Nintendo has offered and continues to improve upon to this day. Then the primary places we must understand the gameworld in which *Super Mario World* is situated is its relationship to Nintendo and the Super Mario series at large.

*Nintendo*
The video advertisement for *SMW* concludes with a person’s hand reaching from the right side of the screen and inserting the game cartridge into the console, dubbed with the narrator saying of the game “And it’s yours, only if you get Super Nintendo” (bennettbuzz). One of the foundational notions we must hold in analyzing the system gameworld of *Super Mario World* is that it is the property of Nintendo and that engaging with the gameworld is a privilege of owners of the SNES console as asserted by the advertisement. This asserted by this advertisement, as well as all packaging for the console and games compatible with the console. To this day, all Nintendo consoles and games prominently display Nintendo’s logo which has sustained very few changes in the almost forty years since they entered the videogame market.

Upon successfully starting the game, the system runs a timed sequence of an opening credit screen and a looping animation of gameplay demonstration until the player advances the state of the system to the selection screen menu. This opening sequence draws many parallels from the medium of film. The first opening credit screen, flashing “Nintendo Presents,” makes use of a common method of attribution in film. This method’s primary function in film is to “enumerate those who have made a contribution to the production,” though “that enumeration has different levels of import according to the type of creative labour being done” (Crawford 60). Nintendo, in this case, is drawing the convention from films that primarily attribute the production to a distribution or production company, as opposed to a film that may attribute the production to a particular person in the case one person is the producer, writer, and director. By remediating this convention for the opening sequence of the videogame, which previously we’ve discussed transitions players’ attention from the real world to the contents of the videogame, Nintendo asserts the world with which players will be engaging as their property. By playing the
coindrop at the exact moment this credit appears, they are entrenching this assertion as the player moves through the game and hears the same chime as they collect coins.

Super Mario Series

The system gameworld of *Super Mario World* situates the content of the game within a larger collection of content that includes all games within the series. The game series itself is inspired by *Donkey Kong*, a game that inspired many series that Nintendo continues to expand on in future titles. By using recurring characters and sprites throughout the series, such as Mario, Princess Peach, and Bowser, the events of the game can be situated in a wider collection of events that take place in all the other games inspired by the series.

The many events that have occurred in the Super Mario gameworld can be dug through many online resources, such as the Mario wiki page, but the way this was handled at the release of *SMW* was through game manuals, a small booklet included with the game packaging that offered instructions for operating the software and information about the game. The first page of content, following the table of contents, is the “Story.” In this section, the narrative content of *Super Mario World* is situated in time following the events of *Super Mario Bros. 3*. It reads, “After saving the Mushroom Kingdom from Bowser and the rest of the Koopas in Super Mario 3, Mario and Luigi needed to recuperate from their adventures. Together they agreed that the best place to vacation was a magical place called Dinosaur Land” (game manual?). In this way, *Super Mario World’s* system gameworld is situated within a wider set of events taking place within the Super Mario gameworld.
Conclusion

The use of “gameworld” that this study is resisting is one that combines the audiovisual representation of system information and the fictional events that are being represented. In terms of semiotics, these would be both the signifier and the signified. I have separated these two, labelling the signifier the system gameworld and the signified as the diegetic world. And finally, I borrow Seth Giddings’s use of the term to contain both of these. From this, arranging Super Mario World within these terms hierarchically, we would see it thus: Super Mario series Gameworld > Super Mario World system gameworld > diegetic world of Super Mario World. I have further subdivided the system gameworld into a system of software layers and transitions. In this way, the system gameworld is able to represent a cohesive, unified world, even though its presentation is fundamentally segmented. By segmenting the system gameworld as such, we were able to see how the structure of the system affords the representation of a cohesive world, and ultimately how each segment of the system gameworld connects back to the wider gameworld.

In the next chapter, I will compare the methods of segmentation used in Super Mario World with a few other games within the Super Mario series. In this way, we will be able to position Super Mario World more carefully in the Super Mario gameworld and entrench this system of desegementing it.
DESEGMENTING THE SUPER MARIO SERIES

In order to examine more closely the gameworld of Super Mario World, it is important to move beyond the game and include other games from the same series. To keep the project manageable, I will include five games in the set for analysis: Super Mario Bros. (SMB), Super Mario Bros. 2 (SMB2), Super Mario Bros. 3 (SMB3), Super Mario World (SMW), and Super Mario World 2: Yoshi’s Island (SMW2).

The action screen layer and game goals are consistent across all five games. They all present 2-dimensional cardinality and 2-dimensional system gameworlds and were released for consoles that could not yet support the 3-dimensional systems so common in contemporary games. The action screen layer for all five games consist of segmented, individually designed levels consisted of background images, platforms, and enemy sprites. The player must reach the end of the level, traveling from the left side of the screen to the far right, scrolling across the level using the controller. Possible interactions in all five games include moving the player-avatar across platforms by walking or jumping, destroying enemy sprites by attacking them with a jump, falling down where there is no platform, reaching the game goal which triggers an event of counting up points accumulated and transitioning to the next level, and many others. This is the formula across all five of these games, and the model of gameplay abandoned for Nintendo 64, although they republished these five games for later handheld consoles. Furthermore, they would return to these conventions in later consoles.

In light of Seth Giddings’s definition of “gameworld” which I have been using throughout this study, all five of these games (and the many games that are part of the series) are part of the Super Mario gameworld. In other words, the gameworld is fundamentally segmented
between these five games. Kristine Jørgensen provided the insight that all audiovisual output fundamentally is an interface to the state of system information. In this way, a videogame is simultaneously an interface to the low level system information and the gameworld, the gestalt of all symbolic associations rooted in the videogames. The gameworld of the Super Mario series is fundamentally segmented between the games that constitute it. To understand how the games sustain the gameworld in form, I will conduct a comparative analysis of five games and their respective game manuals, booklets that were included with the game’s packaging.

**The Diegetic World of the Super Mario Series**

By analyzing the game manuals of all five games, we find that the events of all five games not only take place within the same gameworld, but the same diegetic world. This means that each game does not only relate in that they use a similar set of characters and settings, but that all of the events take place at different times within the same fictional world.

Chronologically, the first set of events would be those that take place in *SMW2*. This game takes place many years before the events of the other five games, when Mario and Luigi were only babies. At birth, while the stork was delivering the babies to their parents’ home, Kamek, a magic-wielding servant of baby Bowser, kidnapped Luigi and failed to kidnap Mario who plummeted down to Yoshi’s Island (*SMW2* Instruction Booklet 3-6). The gameplay charts the experiences of the eight Yoshis that helped Mario rescue Luigi and the stork from Bowser’s castle. The next set of events would be *Super Mario Bros.* in which Mario saves Princess Peach from Bowser who had taken over Mushroom Kingdom, a kingdom within the Mushroom World (*SMB* Instruction Booklet 2). Then in *Super Mario Bros. 3*, Mario saves the entirety of the Mushroom World from Bowser and his cronies, who had stolen the throne of seven different
kingdoms within the world (SMB3 Insturciton Booklet 5). Finally, in Super Mario World, Mario travels to Dinosaur Land for vacation, where Bowser has already occupied the land and Mario must save the princess again (SMW Instruction Booklet 2). While Super Mario Bros. 2 certainly takes place in the same world, the events of the game either take place in Mario’s dream or a dreamlike world, known as Subcon (SMB2 Instruction Booklet 3-4). It is uncertain, nor would it make a difference, when the events of the game took place.

While there is no way to reconcile exactly where each individual setting of each individual game is located relative to one another, we can identify them as places that exist in the same world. The Mushroom Kingdom, the site of Princess Toadstool’s castle, is identified as an “entrance to the Mushroom World” in the SMB3 manual. Mushroom World itself is consisted of eight kingdoms which Mario must save from Bowser’s cronies. Between SMB and SMB3, Mario first saves Princess Toadstool and the Mushroom Kingdom, and then later the eight kingdoms of Mushroom World when the princess was kidnapped once again. The manual of Super Mario World situates its events in Dinosaur Land, a magical place where Princess Toadstool, Mario, and Luigi travelled to after saving Mushroom World for vacation. The first world of this game, Yoshi’s Island, is where the events of SMW2 take place. Subcon, the setting of the events of SMB2, is another magical place, though its location relative to Mushroom Kingdom and Dinosaur Land is a mystery, especially because the nature of the place is inconsistent between the game cartridge and the game manual. Though the game manual situates how they come across Subcon in their world, the game’s ending screen shows that all events took place in Mario’s dream. Therefore, where and when the events take place, or if they took place at all, is ambiguous.
By analyzing the game manuals, we are able to see that all the events contained within the five games take place within the same diegetic world. The games themselves are an expression of segmentation – the Super Mario gameworld is divided between all games in the series. And so each game covers a certain set of events within a certain location within the gameworld. Next, we will see how each game constructs its representation of the space.

**System Architecture and Representation of Space**

In addition to each game taking place in a distinct setting within the diegetic world, each game employs a unique method of representing that setting. However, common to all of them is the segmentation of the system gameworld into worlds and levels. By analyzing how each game uniquely presents its worlds and levels, we can come to understand how it is each game interfaces to the gameworld.

In each game, the level is the fundamental unit of gameplay, time, space, challenge, and narrative, functioning at once as a site of gameplay and as a representation of the diegetic world. Furthermore, each game groups levels into worlds. The number of levels within a world varies across each game, and in some games, the number of levels per world can vary. However, across all games, worlds increase in difficulty as players make progress through the game, and each world’s final level presents a boss challenge. This structure that persists even in later games of the series that present 3D cardinality is fundamental to the segmentation of system gameworlds within the Super Mario gameworld.

One of the first techniques across this set that we must take into consideration is that of level segmentation and selection. We’ve already determined *Super Mario World* uses the world map as an interface metaphor. *Super Mario Bros. 3* was the first game in the series to use a map
screen or to dedicate an entire layer to level selection. *Yoshi’s Island*, though it also offers a level selection layer, uses a tabbed folder interface metaphor. *SMB* and *SMB2* do not offer a level selection layer. In both games, transition screens displaying system information are displayed as the system runs through a timed sequence between levels played in a linear order, though *SMB2* segments this further than its predecessor with a character selection layer.

**Two Layer Systems**

In *SMB*, gameplay is segmented using the fade in and fade out transitions, displaying a screen with key system information, between levels (Fig 4.1). While there are secret areas in a few levels that allow players to warp to later worlds, skipping past two to ten levels, these function more as secrets than a method of level selection. In effect, the first game in the series was composed only of two layers – the selection screen layer and the action screen layer. The notion of place is represented textually both in the HUD of the action screen layer and in the transition screen as a set of numbers representing the world and level. For example, 3-1 would represent the first level of the third world. *SMB2* uses the same method of representing place, except the transition screen system information is also made accessible in the paused state of the game.

![Figure 4.1 Transition Screen. (*Super Mario Bros.*)](image)

86
Instead of the world map to handle representing the notion of place visually, the levels and transitions themselves carry that function. *SMB* does this most notably in starting each level with Mario spawning in front of a castle that he disappeared to in the previous level (Fig 4.2.1). In this way, the game sets up the impression that throughout the whole game, Mario is walking along a single horizontal plane. *SMB2* uses a similar method, but it takes advantage of its more fantastical setting and places a bird’s head, fashioned like a taxidermy piece, at the beginning of each level (Fig 4.2.2). While it functions as an end gate at the end of the levels that the player-avatar walks through, it functions aesthetically in the beginning of levels, signifying that the player moved through two bird heads like a portal.

**Figure 4.2.1 SMB Level Transition.** Level 1-1 ends with Mario walking into a castle in an animated sequence. The system cuts to the transition screen. The next level starts with Mario walking out of the same castle (*Super Mario Bros.*).

**Figure 4.2.2 SMB2 Level Transition.** Level 1-1 ends with Mario walking through the mouth of a bird. The next level starts with the bird’s head directly adjacent to where Mario spawns (*Super Mario Bros. 2*).
These two-layered systems by design were played in a linear fashion. With the restraint of using visual cues within the action screen layer and representing place textually in the HUD and transitions, the player must move through the game level-by-level without having to decide what level they would play next. By introducing a third layer in Super Mario Bros 3., how the player navigates from level to level became a more pronounced design feature in later games.

*Three Layer Systems*

The introduction of the map screen layer in *SMB3* introduced the level selection feature. On starting a game, the system would start in the map screen layer. A transition animation transforms a small window with system information into a ring of stars that moves to the starting position of the world and spawns Mario (refer to image). From this screen alone, the dynamic experience afforded by level selection is evident – not every level of the world needs to be played in order to reach the fortress, beat the boss challenge, and move to the next world. At the same time, nothing stops the player from playing every level in the world if that’s the experience the player wants. The main restraint this system imposes is that once a level is beaten, the level cannot be replayed. The game, like the other two NES games, still is designed for play in a single session, although it offers even more secrets for warping between worlds.

Installed with more memory and higher processing power, the Super Mario games for the SNES were designed for multiple play sessions for a single playthrough of a game by introducing save features. But more importantly, it allowed for a more elaborate world map system. *SMB3* did not allow replay of already beaten levels, but moreover it didn’t allow for moving backwards to previous worlds. Once the fortress of a world was beaten and the system transitioned to the next world, there is no possible way to move to a previous world. *SMW* and
*SMW2*, by interconnecting all the worlds in a single set of screens, was made up of levels pertinent for replay and dynamic engagements with the system motivated by unlocking new levels on the map. Such a system necessitated a save function and for playthrough to be possible across multiple play sessions.

Though all three of the three-layered games afford level selection, *SMW2* stands out from them in its interface metaphor. It still visually depicts the world in a map, but the site of interaction itself is a series of navigable icons laid out in a tabbed folder (refer to image). Instead of using a miniature player-avatar on the level selection menu, a cursor fashioned as a hand pointer is used to navigate between levels. In this game, finding secrets are not a game goal in themselves, but a means to an end for collecting tokens that are tallied up for a score at the end of each level. Getting a perfect score in all the levels of a world unlocks two additional levels with the world. In this way, a three layered-system does not necessarily lead to the dynamic, nonlinear style of game system as is present in the other two games. Rather, it is the interface metaphor and how it is employed for the game’s design that structures play as such. Because *SMW2* does not need to ground motivation for play in the unlocking of space in the world map,
such a representation is foregone for a system more elegant for navigating between levels quickly.

Despite utilizing a third layer for level selection, \textit{SMB3}, \textit{SMW}, and \textit{SMW2} present unique systems with varied interface metaphors and hardware restraints. Such variance leads to three differently designed systems that are played and navigated in fundamentally different ways. \textit{SMB3} must be played in a single session, \textit{SMW} motivates players to explore and replay to advance to the end, and \textit{SMW2} is linear like the first two games in the series.

**Level Selection and Immersion**

The designs of \textit{Super Mario World} and \textit{Super Mario World 2: Yoshi’s Island} present a unique case for assessing the topic of immersion in games. Janet Murray’s notion of immersion in how well it represents reality is well critiqued, but Jørgensen’s take on it has remained under studied. Her claim is that immersion should be measured by how readily the system offers information to players regarding goals and how it challenges players methods of achieving those goals (Jørgensen 31). By Murray’s definition, \textit{SMW} would be the more immersive game, as it more accurately models real life in the world map interface metaphor. However, as her treatment of immersion has already been well-critiqued, we can dispense with this view. Adopting Jørgensen’s viewpoint, we can see that they are equally immersive in that their interface designs facilitate the forms gameplay take.

In \textit{SMW2}, the interface is designed like a folder, but the spatial representation of the world is a non-interactive, scribbled map. Movement through each world is represented by a correlation between the top half of the screen and the bottom half. The player moves a cursor between icons in the top half to navigate between playable levels. The bottom half represents
each of those levels as bright red dots on the map, each one guarded by one of eight different colored Yoshis. Each Yoshi can be in two different states. In one state, the Yoshi is idle and holds a sign with a number on it that correlates to the number of the level in the menu. In the other state, Yoshi is walking in place with Baby Mario on his back. At any one time, only one Yoshi will be in the second state. Yoshi will be in this state if the cursor in the top half is, at the time, selecting the level which corresponds to that Yoshi. So if the cursor is on level 4, the Yoshi that in the first state would be holding a sign with the number 4 would be in the second state. So the map portion, different from *SMB3* and *SMW*, no longer possesses any interactivity in itself—it provides audiovisual output that represents the level selection in the tabbed folder, the true site of interaction. This makes navigation much faster and easier compared to the other two games.

Because the design of the game is based on repeated play of a level to collect all tokens which can be in hidden areas, this is a more efficient level selection menu for this game. In Murray’s treatment of immersion, this system of navigation would be considered less immersive than the world map interface metaphor; however, framing it in Jørgensen’s treatment of immersion, it is equally immersive. It foregoes the more realistic yet more time-consuming system of navigation in *SMW* for one more suited to the design of gameplay.

**Selection Screen Layer and System Gameworld Segmentation**

The selection screen layer in every game we are working with is manifested in the title screen. The layer is present across all five games and carries out the primary functions of selecting the play mode and starting the game. The specific functions vary across each game. Along the divide of hardware, the main difference we can identify is that the selection screen layer in *SMW* and *SMW2* afford a choice to players between three save files. However, looking
more closely shows that within each game, the selection screen layer serves different functions in each game. In analyzing the five games comparatively, we see that differences in design of the system gameworld architecture means the selection screen layer sits differently within their respective games.

**Demonstration of Gameplay**

*SMB*’s selection screen layer only affords one function of interaction – choosing either one player mode or two player mode. However, the screen carries out another important function that only one other game (*SMW*) in our set offers – a demonstration of gameplay. As the Super Mario series is one of the cornerstones of Nintendo’s success in the videogame industry, they must take care to offer consumers with no prior experience with videogames the information they need to enjoy the game system. Anna Anthropy in *A Game Design Vocabulary* explains how by design, the first level of *Super Mario Bros* carefully oriented players to its rules. The selection screen layer in its loop of the selection menu and in its demo of gameplay must be understood in this context as well. To this end, it is no mistake that both games that include a demonstration of gameplay were the first titles within the series released for their respective consoles.

**Infinite Loop and End Resolved Systems**

In *SMB*, the system always returns to when the game itself has been resolved. Whether the system reaches game over because the player died with no remaining lives, or because the player beat the game, the system always loops back to the title screen in this game. In this way, the game is always coaxing the player to play more and play again – try something new this time, try something different. Such a design was very well-suited for the arcade game era. We
can call such games infinite loop systems. The games in our set that fall under this category are
\textit{SMB} and \textit{SMB3}.

This differs much from the other three games in our set – instead of infinite loop systems, we have an end resolved system that ceases to respond to input once the player has beaten the game. The elaborate cutscenes that follow the ends of all three of those games are the crux of understanding this disparity. As previously established, a cutscene is a form of transition between sites of interaction. Different from the infinite loop, the cutscene that results in a “The End” screen at the end should be considered a transition back to the hardware layer of the system. The position of the selection screen layer must be understood relative to the type of system in which it is designed. In an infinite loop system, the selection screen layer is something of a home base. Its function as a gameworld interface is a place the player will always return to in both entering the system and reentering the system. In an end resolved system, the selection screen layer functions as a one-way door into the system gameworld that when resolved forces the player to exit the software entirely.

\textit{Story}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{selection_screen_story.png}
\caption{\textbf{Figure 4.4 Story in the Selection Screen Layer.} The selection screen layer in \textit{SMB2} and \textit{SMW2} serves storytelling functions (\textit{Super Mario Bros. 2}) (\textit{Super Mario World 2: Yoshi’s Island}).}
\end{figure}
The selection screen layer of *SMB2* and *SMW2* carry storytelling functions through text and animation (Fig 4.4). The work of telling the story and orienting players to the fictional setting and scene of the game is done between the game manual and the selection screen layer of these games. This differs from the way telling the story of the game is done in the other three games. In *SMW*, the story is told as the player makes progress through the game through cutscenes. In *SMB* and *SMB3*, the premise of the story is contained wholly in the manual and the system uses cutscenes throughout to connect the events experienced during gameplay to the premise of the story told in the manuals. By adding the story to the selection screen layer, there is a different assertion being made by the system about the role of the story in the game.

In *SMW*, the system ignores all input for a set amount of time during a cutscene. The narrative elements are included during the core loop of gameplay and are defended by the system by temporarily ignoring all inputs. In *SMB2* and *SMW2*, narrative elements are included in the selection screen layer. By doing this, the system adds this function to the selection screen layer which carries out the primary purpose of selecting save files and modes of play. Ultimately, this reduces the prominence of story in those games, by making the portions of the system dedicated to storytelling skippable and subordinate to other functions in the layers they are embedded. In *SMB* and *SMB3*, there is no story offered in terms of relaying the premise of the story; the work is offloaded to the game manual in these cases.

*State Change*

*SMW2’s* selection screen layer involves an expression of the diegetic world of the story in a way that the other four games in the set do not. After the initial story sequence, the selection screen layer transitions to the selection screen. This visually depicts Yoshi’s Island, a tropical
island with many sites of interest made clear as the camera revolves around the island (Fig 4.5).

During gameplay, when a player has beaten a world, a cutscene takes place on the island depicted in the selection screen menu. Yoshi traverses the island to one of the castles, after which the castle explodes and is replaced by a white flag (a convention innovated in SMW) with a green “Y” on it. The system saves this information and on restarting the system, the island in the selection screen represents all worlds beaten so far in the most recently played save file as those white flags. In this way, the selection screen layer is connected to the map screen and action screen layers in a way that had not been the case in the other four games. The other four games keep the selection screen layer’s state totally unaffected by the events of the other layers.

**Conclusion**

Though every game in the Super Mario series is part of the same gameworld, there is no consistency regarding how each game draws from or contributes to the gameworld. Rather, each game uses different techniques of segmentation and different relationships between those segments that help define their relationships to the gameworld. The comparative analysis of these techniques, game content, and supplemental materials allowed us to position each game relative
to the gameworld and each other. Such an exercise is crucial in the desegmentation of any game that is part of a series of games. From this, our experiment in applying the layered system model and methods of desegmentation resulted in a clear topology of the Super Mario gameworld and insights regarding how each game constructs their position within that topology.
CONCLUSION

At the outset of this research project, I was much more invested in the world map interface metaphor of *Super Mario World* than advancing any methodology or way of thinking about games. I had no interest in imposing my position on gameworlds or methods of analysis. The original subject of my interest, overworlds in 2-dimensional games, has fascinated me ever since I picked up the habit of playing videogames. What I originally intended was to share the insight I had gleaned from a long-term relationship with 2D worlds, an obsession with the design of 2D systems and how they mapped space. While the backbone that sustains the research topics within this study is composed of that fascination, the shape this study took addressed a set of problems that had to be addressed before such work was possible.

The marketing language of virtual reality game consoles and augmented reality games suggest immersivity precluded an accurate representation of the so-called real world. With the ubiquitous place advertisement has in media consumption, especially with its relatively recent adaptations in targeted ads in social media, the spread of information has been made divisive. But even in that, I was content to keep my view on games to myself. But when I found echoes of the sentiment that VR and AR games were more immersive because they represented “reality” in research literature and academic theories of videogames, that this work on gameworlds and interface was a necessary step in later covering research on overworld in 2D games. And so the position I took was strengthening the voices of researchers that advanced a more nuanced position of immersivity, gameworld, and interface.

The methodology I have proposed advances two primary assertions. It first asserts that limiting treatment of gameworld to time spent engaging with the system underlies a need to keep
play and games within the confines of “leisure time.” It adopts the viewpoint that even serious academic work on games does not need to abandon the love of play and games that motivates community behaviors, that even in the name of leisure tend to be highly disciplined. Furthermore, it allows game systems more room to breathe, acknowledging that even the games themselves are only one segment of the gameworld in which it exists. The second assertion it moves forward is one about interface and immersion – that the game system itself is an interface and immersion must be understood relative to player goals and objectives, not its accuracy in representing or simulating reality.

With these two points in mind, I see three directions future research can move. One is toward interface design, learning from game systems’ ability to model worlds without having to accurately represent them. A problem I’ve had with the state of computing in modern society is the ubiquity of Windows and Mac operating systems, specifically their overreliance on the desktop interface metaphor that seems to have supplanted the potential of diverse digital media. As the rise of interfaces that use motion sensors and voice recognition to interpret gestures and speech pervade daily life, how information is visually represented on a screen is a matter that must be revisited. I suspect the personal computer will undergo significant changes over the next decade or two as more embedded system interfaces pervade our daily lives.

The second direction is towards a closer analysis of segmentation in 2D games. Though all major platforms for gaming include hardware that supports massive 3D worlds, a booming industry of indie games, or independently designed and developed games, have a significant hold on the market. Such games, such as *Cuphead*, *Gorogoa*, and *Shovel Knight*, often include some kind of overworld system, some of which utilize techniques exactly as the games under analysis
of this study use. The insight this study provided was that games interface to a wider gameworld. A research question that I have moving forward is: if we consider techniques of segmentation to make up their own network within the wider network of videogames, what are the characteristics of the relationship between games that use similar or identical techniques?

Finally, the research area I am most interested in and that started this study is the use of maps as an interface metaphor. *Super Mario World* and *Super Mario Bros. 3* are only two games out of many that use this interface metaphor. In my own gameplaying, I have encountered the use of maps as an overworld, a mini-map to aid navigation of large 3D worlds, and as a gameboard in turn-based strategy games. A comparative analysis of these uses of a map in these different positions in different systems would be a ripe project for further studying segmentation, simulation, and interface.
WORKS CITED


bennettbuzz. “Super Mario World Commercial (America).” *YouTube*, YouTube, 22 Oct. 2006, www.youtube.com/watch?v=azpSVs0e6qM.


Church, Doug. “Formal Abstract Design Tools.” *Game Developer*, vol. 6, no. 8, 1999, pp. 44.


Crawford, J. A. M. *Film credit*. University of South California, 2013. PhD Dissertation, University of South Carolina.


STANITZEK, GEORG. "Reading the Title Sequence (Vorspann, Générique)." *Cinema Journal*, vol. 48, no. 4, Summer 2009, pp. 44-58.


“*Super Mario Bros. 2 Instruction Booklet.*” Redmond: Nintendo of America (1988).


“*Super Mario Bros. 3 Instruction Booklet.*” Redmond: Nintendo of America (1990).


