THE UNIVERSITY OF CHICAGO

VIDEO GAME MUSIC, MEANING, AND THE POSSIBILITIES OF PLAY

A DISSERTATION SUBMITTED TO

THE FACULTY OF THE DIVISION OF THE HUMANITIES

IN CANDIDACY FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY

DEPARTMENT OF MUSIC

BY

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CHICAGO, ILLINOIS

JUNE 2020

For my grandmother,
Sarah Florence Grasso aka "Nana" (1932–2015)

and my uncle,
John J. Adams, Esq. (1957–2011)

Thank you for playing with me.

Play, we said, lies outside the reasonableness of practical life;
has nothing to do with necessity or utility, duty or truth.
All this is equally true of music.

— Johan Huizinga, *Homo Ludens* (1938)

Contents

List of Figures

All screenshots are from the author, unless otherwise stated.

List of Musical Examples

All musical examples are the author's transcriptions, unless otherwise stated.

List of Tables

Acknowledgements

There are many, many people to thank for their help, support, and guidance throughout the process of writing this dissertation—because, as the old man in the cave in *The Legend of Zelda* once said, it's dangerous to go alone. Acknowledgements are difficult to write because, in the hazy brain-scramble of finishing this document, I have certainly forgotten someone. And I know that I'm likely not even aware of the various conversations, moments, and gestures that secretly cast their magic and helped develop some ideas. But I'll do my best here.

Thanks to my advisor, Larry Zbikowski, who has been a mentor since I first stepped foot on UChicago's campus, months before I matriculated as a young(ish) graduate student. Larry's enthusiasm in my project was key to actualizing it, and his suggestions on various drafts (that I inevitably sent in the middle of the night) helped make that actualization actually readable. The guidance and mentorship of my committee members, Steve Rings, Berthold Hoeckner, and Patrick Jagoda, have shaped the ideas of this document even before it was in nascent proposal form. I'm not exaggerating when I say that taking courses with each of them has allowed me to envision what theory and analysis could be and could accomplish, musical or otherwise. Their personal encouragement throughout these past seven years helped me stick with it even when I thought I might not.

Thanks also goes to various faculty both in and out of the music department, with whom I've had essential and fruitful conversations—especially Jennifer Iverson, Bob Kendrick, Seth

Brodsky, Travis Jackson, and Kaley Mason. Thank you to Janet Schmalfeldt for reviving my love for tonal analysis. And thank you to the staff that make the music department run, especially Peter Gillette, Molly Murphy, Angela Risi, Emily Anderson, and Melanie Cloghessy, who have opened doors of all sorts in my time here.

I'm very grateful to the University of Chicago's Graduate Aid Initiative (2012–17) for financial support, and for continuing support through the Franke Institute for my dissertation work over the 2018-19 academic year. Many thanks to all of my fellow fellows at the Franke. It was such a privilege to be able to share my work and some tea with brilliant folks from across the humanities, and to learn from them as well. Special thanks goes to Amanda Shubert for the extra commiseration, support, and wisdom.

Because this dissertation has grown out of work that I started as an undergraduate, I'd also like to thank my mentors from my time at Princeton—Noriko Manabe and Dan Trueman saw my very first writings on video game music, and fellow band clarinetist Ben Elias encouraged me to pursue these ideas in a PhD.

I'm not sure where I'd be without the support and comradery of the fellow graduate students (many of whom are no longer students) in the music department, including those from my 2012 cohort: George Adams, Lindsay Wright, Nadia Chana, Ted Gordon, Ameera Nimjee, Will Buckingham, Braxton Shelley, and my fellow musketeers, Anabel Maler and Jess Peritz. Beyond my cohort, special thanks must be given for the friendship, advice, and jokes over the years from John Lawrence, Ailsa Lipscombe, Peter McDonald, and Laura Turner. I am unbelievably fortunate to call these brilliant people my friends.

I must also thank the students I've taught over the years, the wonderful undergraduates at UChicago who might have taught me more than I've taught them. Special thanks to the students of MUSI 26819, my first video game music course, for showing up and bringing so much wisdom and passion to the classroom every week.

Beyond UChicago, I've had the fortune to be welcomed into the warmest community of scholars that exists, even if I might be a little biased. The "ludo folks," or fellow scholars who work on video game music, have supported this work from the very start. Special thanks goes out to my fellow Twitch shenanigamers Ryan Thompson, Dana Plank, and Karen Cook. And thank you to all who tune in each week. Playing video games with you guys every Thursday is a joy. Thanks also for brilliant discussions and advice from Will Gibbons, Steve Reale, Will Ayers, Pete Smucker, Stefan Greenfield-Casas, Kevin Burke, Jesse Kinne, Sarah Pozderac-Chenevey, and Tim Summers. Thanks to Peter Shultz who introduced me to the University of Chicago and whose work has directly inspired mine. Thanks to Elizabeth Medina-Gray, who gave a conference paper back in 2011 that was the very first video game music paper I'd ever seen, and which inspired my graduate studies. And thanks to everyone on Twitter who offered scholarly and moral support, even to a stranger.

Thank you to my friends beyond academia, especially Josh Rowe, Ellen McGeoch, Ally Bress, Erika Schnatz, and Tom Westergard for the endless support throughout the years as we all pursued our own graduate degrees. Thank you to Neal Scott, for listening, and for everything.

And thank you to my family, my big Italian family from New Jersey that always supported my academic aspirations. Thanks to my grandparents, aunts, uncles, and cousins,

especially Richard and David Adams who played video games with me all throughout our childhoods.

Thank you especially to my parents, Nedda and Leonard Grasso, for believing in the value of a humanities education, and for believing in me. Mom, I probably can't fully appreciate how much you've sacrificed for me, but I can start by thanking you for getting me music lessons and sacrificing your time, money (and ears) so that I could pursue what I loved—even the things that I loved but wasn't very good at. And Dad, you've helped inspire some ideas in this dissertation, and have been the voice of reason in the most unreasonable times, for which I am ever grateful. Thanks to Katie Grasso for always being the guiding older sister, and who introduced me to *Final Fantasy IV,* thereby planting the seed of this entire dissertation and my career. Thank you to Lenny Grasso for being the patient younger brother and my "player 2." I love you all.

Abstract

This dissertation explores the nature of musically mediated gameplay, establishing conceptual frameworks for understanding music as constitutive of video games rather than superfluous to it. The project starts with the premise of play as a form of cognition, extending the self into virtual environments with special rules, logics, and boundaries. This theory is extended to encompass music, which generates its own rules and boundaries through special resources for meaning, affect, and expectation. These rules, or musical frameworks, mold the point of encounter between player and game. In positioning music as part of the interactive ecologies of video games, I outline how music is a substrate for experience and meaning-making in virtual environments, and how play, in turn, shapes musical meaning.

Chapter 1 discusses the *magic circles* of games that contextualize meaning and offer possibilities for music to shape those meanings. Chapter 2 develops a concept of *affective zones* that circumscribe musical spaces of feeling and perception. Chapter 3 considers the formal structures of games through the procedures of music, developing a theory of *ludomusical narrativity*. Finally, I show in chapter 4 how music can be considered part and parcel of interactive ecologies through player adaptation, or *habituated play*. Each chapter investigates a different facet of gameplay, considering the inherently musical ways that meaning is created in the seemingly endless possibilities of virtual worlds.

Introduction

For a little over two decades, the UK-based radio station ClassicFM has held an annual public vote to discern the top 300 most beloved musical works.[1] In 2013, Nobuo Uematsu's collective soundtracks for the *Final Fantasy* series reached number 3 (figure I.1), surpassed only by perennial fan favorites—Rachmaninoff's Piano Concerto no. 2, and Vaughan Williams's *The Lark Ascending*. While music of *Final Fantasy* isn't the only non-classical music to make this list; (some film scores and a few other video games' collective soundtracks cracked the top 300), the list is otherwise unsurprisingly dominated by art music classics.

How could decidedly non-classical music reach such heights in ClassicFM's rankings? Some internet campaigning was at work here—gaming fan communities organized around the cause to give Uematsu and other video game music composers "the recognition [they] deserve," according to online comments on ClassicFM's website.[2] Several voters revealed a slight embarrassment that video game music reached *such* high standings, but were proud for having voted for it, holding firm that video game music is good and valuable—at least deserving *some* place in the ClassicFM Hall of Fame. The music is, after all, "played with classical instruments," one commenter notes, "so why be snobby because it's not 100 years old?"

[1] "ClassicFM Hall of Fame 2013," http://halloffame.classicfm.com/2013/.
[2] Online comments accessed on September 27, 2019. http://halloffame.classicfm.com/2013/chart/position/3.

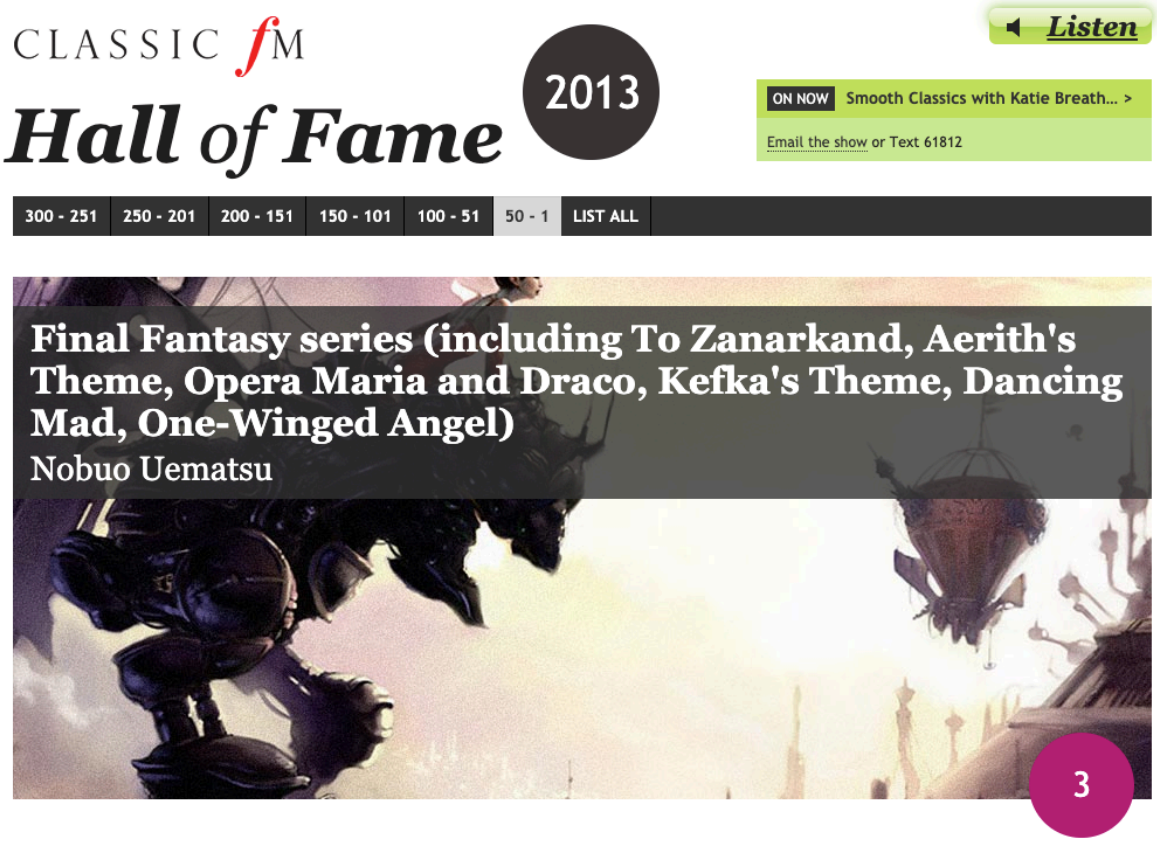

Figure I.1: Webpage for ClassicFM Hall of Fame 2013. The *Final Fantasy* series reached #3 in the 2013 rankings.
(source: http://halloffame.classicfm.com/2013/chart/position/3)

A few ostensibly clearheaded folks left comments with criticisms that Uematsu's *Final Fantasy* music is "dull," boring, and "total CRAP," utterly undeserving of such a ranking above the relative sublimity of, say, Beethoven's oeuvre.[3] Indeed, the particular comparison to Beethoven could refer to ClassicFM's own description of Uematsu:

[3] Notably, as of the 2018 rankings, Beethoven has yet to reach the top spot.

> Sometimes referred to as the Beethoven of video games music, Japanese composer Nobuo Uematsu has made his career and reputation from his soundtracks to the enduring *Final Fantasy* video games. Now on the 14th instalment, the series is noted for its incredibly cinematic feel, and much of that is down to Uematsu. He's part John Williams, part Wagnerian leitmotif, part new-age soundscaper—and a legend in his own right. The level of interest in the scores to these games should not be underestimated. Concerts of *Final Fantasy* music sell out across the world, with Uematsu often in attendance and the kind of fanbase most pop stars would be envious of. One gets the impression, though, that none of it would be worth it if the tunes didn't stand up to scrutiny. They certainly do.[4]

An online campaign to give video game composers "deserved recognition" (and the subsequent defense and ownership of its success) gives the impression that this was not the work of online "trolls" seeking to undermine the hallowed institution of classical music. Rather, these were the earnest efforts of a whole lot of people who care a whole lot about video game music.

Certainly, it was enough to spark debate (and perhaps ad revenue) for ClassicFM.[5] But could the bewildered (and somewhat offended) non-gamers be *wrong*? What is clouding the judgment of gamers that would lead them to elevate something like "Aerith's Theme," a track from *Final Fantasy VII* (1997) that relies on electronic approximations of orchestral instruments, into the spheres of *real, true* orchestral masterpieces?

The question of "what counts as classical music" gets into the weeds and implicates other forces at work in the formation of musical fandom. (Others have dealt with this question in some

[4] Webpage description, author unknown. http://halloffame.classicfm.com/2013/chart/position/3.
[5] ClassicFM directly solicited opinions on the inclusion of video game music, specifically. Interestingly, the implication here is that other kinds of non-classical soundtracks are not *also* questionable choices for the rankings—at least not as questionable as video game music. https://www.classicfm.com/radio/hall-of-fame/2013/video-game-music-hall-fame-opinion/

detail already.[6]) I'd rather ask: what's going on *in video games* that turns background music—"total CRAP" to some—into definitively non-crappy art music for so many people? Why do people listen to (and rearrange, and remix, and perform) this music outside of video games at all? Perhaps the online campaign for video game music *was* misguided—to rank "Aerith's Theme" and its ilk next to symphonies and concertos is to obfuscate what actually makes that music valuable and worth listening to for many people. In other words, what if we put this music back into play?

Analyzing Video Game Music

In this dissertation, I examine how music in video games shapes gameplay, taking a theoretical and analytical approach to uncovering specific musical meanings in spaces of virtual interactivity. My aim is twofold: (1) to explicate the resources that music offers for meaning-making in play, and (2) to capture some of the emergent meanings that play then offers music. I argue that video games allow for musical meaning to shape—and be shaped by—experiences of encounter, learning, and adaptation in worlds of immense possibility beyond our own.

To analyze video game music is to contend with the messy nature of interactive multimedia, where players are far from the ideal listener—if they are listening at all. In most video games, we might consider players to be playing *alongside* music, in a relationship that's

[6] See William Gibbons, *Unlimited Replays: Video Games and Classical Music* (New York: Oxford University Press, 2018*);* and "How It's Meant to Be Heard: Authenticity and Game Music," *The Avid Listener*, September 21, 2015, https://www.theavidlistener.com/2015/09/how-its-meant-to-be-heard-authenticity-and-game-music.html.

only sometimes directly interactive, as in the case of music performance games (such as *Guitar Hero*) or other games that feature musical instruments (such as *The Legend of Zelda: Ocarina of Time*). It is thus common to see video game music described as "background music," which presumes a "foreground" that excludes music in some way. It is in this foreground that the primary interactions of play occur: press a button and your avatar jumps, an item is collected, a trigger is activated, and so on. Yet music is a constant, often omnipresent force in video games. Players are typically engaged in a number of tasks for which music can function as accompaniment, but there is rarely a reason why players would need to stop and listen. Even when music changes in some way, perhaps even adapting directly to a player's actions, music remains in the background.

When ClassicFM's listeners valorize video game music, I wouldn't say they've got it all wrong. What sounds like background music *is* background music, but what I argue in this dissertation is that those interactions in the foreground of games are nonetheless musically mediated. Play, then, is a process of enacting musical experiences.

Cinematic Resonances

Focusing on play separates video games meaningfully from other forms of musical multimedia. Nonetheless, because video games are often narratively designed, it isn't difficult to see resonances with film in certain formal and aesthetic ways, particularly given the basic notion that music can enhance whatever is happening on screen. Several scholars have drawn parallels,

even tracing a lineage between film music and video game music.[7] Perhaps more importantly, game composers sometimes explicitly seek to emulate film scoring, arguing that music should aspire to sound as if it were a continuous score for a game.[8]

Given these relationships between game and film, it is interesting to note that the ClassicFM webpage for film composer Howard Shore contains just a few comments, only one of which does *not* celebrate his inclusion on the Hall of Fame list ("Hmm. Too much movie music, IMO").[9] Indeed, unlike game music, film music has already achieved a level of public and institutional prestige, particularly on account of its contact with contemporary, composerly art music at its birth in the early twentieth century.[10] In terms of the techniques employed, those connections weren't too difficult to make; film has always been accompanied by live or live-recorded music. Furthermore, the composition of film music rarely depends very much on the audience—its fine-grained details and changes are determined by those producing the film.

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[7] For example, see Neil Lerner, "Mario's Dynamic Leaps: Musical Innovations (and the Specter of Early Cinema) in *Donkey Kong* and *Super Mario Bros*" in *Music in Video Games: Studying Play*, eds. K.J. Donnelly, William Gibbons, and Neil Lerner (New York: Routledge, 2014), 1–29.

[8] In an interview for *Computer Music Magazine* (November 2012), game composer Stephen Baysted explained his process: "Interactive or adaptive music…is mostly looped and layered. With each successive layer normally comes additional musical or rhythmical complexity, and these layers are triggered as the player interacts with the environment—it is almost as if the player is playing or performing the music. But regardless of the underlying mechanics, the illusion of continuous cinematic-style music is the order of the day" (38).

[9] Comment accessed September 27, 2019 at http://halloffame.classicfm.com/2013/chart/position/20/.

[10] That film genres have long been subdivided *themselves* along the spectrum of high and low culture, of art and pop, is evidence of a large-scale cultural absorption that video games might never reach. Video games as a medium are still disparaged by criticisms, sometimes valid—games are too violent, too sexist, too addictive. To many, video games are something to grow out of, and this apprehension of video games' childishness derives from the marketing and technological histories of the game industry. Games in the US were primarily aimed at children in the 1990s, and the simplistic presentation of graphics and sound offered an easy mapping between nascence of technology and its juvenile functions.

Games extend a hand to the player: video game music is as much about adapting to the contingencies of play as it is about matching aspects of narrative design. Exceptional experiments in interactive media notwithstanding, a film cue never has to loop around and around again waiting for the audience to press A.

Indeed, within the cinematic resonances of games there is a conflict between the movie theater and the playground, between the sensory spectacle of film and the banality of repetitive, circular action of games. Video game music might sometimes aim to be the former, to trick the player into perceiving their actions as events in the course of a film. But some of those actions don't count—if you fail, you start over. The music that might accompany your failure operates to interrupt the cinematic aspect of the score, where continuity requires success. The ways in which games are beholden to user experience could be seen as a limitation. Or a realm of possibility.

The successes and failures of play define being in virtual worlds, and form relationships to soundscapes as actionable features of an environment. The cinematic audience doesn't "learn" an environment like players do; video game players experience cinematically poised music in ways that use and then recontextualize their meaning. Video game music can involve familiar musical meanings, to be sure. Music rhythmically emulating the gallop of a horse might be used during a horseback sequence in film, or triggered in games to occur whenever the player is on a horse. On the other hand, what does the traditional Russian folksong "Korobeiniki" have to do with stacking blocks in *Tetris*? Musical associations are, in some cases, arbitrary. Much of this dissertation will argue that it doesn't matter all that much: music in combination with game

structures can offer players a means of understanding the weird worlds of video games. Perhaps the storytelling nature of "Korobeiniki" offers a feeling of narrativity in an otherwise abstract environment of *Tetris*. Or perhaps something about the particular dance-like rhythms of the song creates space for an emergent understanding of the *Tetris* blocks as radically embodied extensions of the self.[11] In any case, analyzing music in play can get us closer to understanding virtual interactivity writ large.

Background

One of the major difficulties of this project is also one of its most exciting aspects—video game music is a relatively new area of study, an open field of opportunity just starting to find scholarly ground, flourishing in the form of conference presentations. Recent years have seen the emergence of dedicated conferences to video game music in the US and Europe. On this side of the pond, the North American Conference on Video Game Music held its sixth annual meeting in March, 2019. In Europe and the UK, the Ludomusicology conference held its eighth conference in April, 2019.

Published work on video game music is wide-ranging in its subjects for investigation, from the repetitive 2-D levels of *Tetris* to the expansive multiplayer online game *World of*

[11] Some recent papers at the North American Conference on Video Game Music have intriguingly addressed this topic. William Ayers discussed embodying *Ecco the Dolphin* in "What is it Like to be a Dolphin? Echolocation and Subjectivity in Video Games." Stefan Greenfield-Casas explored concepts of AI subjectivity in "The Lament(s) of the Posthuman: Existential Voice and/in *Nier: Automata* (2017)." Hartford, CT (March 30–31).

Warcraft. General or comprehensive studies on video game music from scholars and industry professionals alike has followed two main paths thus far: (1) historical approaches accounting for compositional techniques through the lens of development in gaming technology; and (2) descriptive accounts regarding the myriad uses for music as a functional feature, and what sorts of compositional strategies might be used to realize game-specific roles.[12] The most frequently cited examples of these approaches include Karen Collins's work on the history and conceptualization of video game audio in her monographs *Game Sound* (2008) and *Playing with Sound* (2013), which provide grounding for the history and terminology for the field; and Kristine Jørgensen's 2009 monograph *The Comprehensive Study of Sound in Computer Games: How Audio Affects Player Action*, published from dissertation work, identifying the different roles of sound in games.

Recent years have also seen dedicated monographs that center on video games but expand beyond it, particularly as a social and cultural form. Kiri Miller's work in her monographs *Playing Along: Digital Games, YouTube, and Virtual Performance* (2012) and *Playable Bodies: Dance Games and Intimate Media* (2017) are important contributions to the largely overlooked sphere of virtual performance studies, positioning music as a productive site for social collaboration and physical participation. William Cheng's *Sound Play: Video Games and the Musical Imagination* (2014) is an interdisciplinary approach to some real-world ethical

[12] My undergraduate thesis (2010) came out of the former trajectory, documenting a history of musical composition through a history of technological evolution in the *Final Fantasy* and *Legend of Zelda* series.

and social issues brought to light amidst the seemingly innocuous realm of video game music, arguing that sound spaces are more fraught than one might initially think. William Gibbons, in *Unlimited Replays: Video Games and Classical Music* (2018), explores the implications combining what are considered low and high forms of cultural activities. Roger Moseley's *Keys to Play: Music as a Ludic Medium from Apollo to Nintendo* (2016) expands the notion of play to encompass a historical range of musical practices, centering on the piano keyboard.

More directly analytical approaches are starting to see light in publication. Steven Reale and Peter Shultz have both analyzed the intersections of music theory and video games, particularly in rhythm-based games in which music offers a "score" of sorts.[13] One of the most systematized new applications of music theory to date is Elizabeth Medina-Gray's dissertation (2014) on the concept of "smoothness" between discrete musical "modules" in games with adaptive music such as *The Legend of Zelda: The Wind Waker* and *Flower*. Tim Summers's *Understanding Video Game Music* (2016) simultaneously summarizes prior approaches while also offering a guide for comprehensive analysis of any kind of music in video games.

In this dissertation, I consider my approach wide-ranging but I do not claim it to be comprehensive; I do not explicitly develop new methodologies for broad-strokes analyses. Rather, my analyses aim to capture something fundamentally unique about music in video games in order to inform our approaches to musical meaning and experience even beyond games. In

[13] Steven Reale, "Transcribing Musical Worlds; or, Is *L.A. Noire* a Music Game?" in *Music in Video Games: Studying Play*, K.J. Donnelly, William Gibbons, and Neil Lerner, eds. (New York: Routledge, 2014), 77–103; and Peter Shultz, "Music Theory in Music Games" in *From Pac-Man to Pop Music: Interactive Audio in Games and New Media,* Karen Collins, ed. (Burlington, VT: Ashgate, 2008), 177–188.

describing music, I lean less on musical *function* and more on potential musical *experience* that, while influenced by function, need not be ruled by it. By approaching video game music as a substrate for many possibilities of experience and interpretation, I aim for an application of music theory that speaks to a broad range of fields and concerns.

Playing With(out)

One of the constraints of this dissertation is that it makes little mention of multiplayer games, whether cooperative or competitive games that involve the playful interactions of two or more people with each other (networked or not, online or in-person). But to account for the rich interplay of musical meaning in games requires the perspective of a single player. These single-player analyses do not preclude an application to games with several players at once, but it is simply much more efficient to describe musically mediated gameplay from the perspective of a single person. Even so, one of the promises of this project is that musical meaning can circulate beyond any one instance of play, creating the potential for building communities of fans around these individual experiences that are nonetheless shared.

Chapter Summaries

Chapter 1, "Playful Meanings," sets the groundwork for the dissertation, starting by characterizing the music of video games as essentially rule-based, emerging from computational code that defines routines and procedures that govern how music is deployed within the game. I

discuss the various resources that music offers for video game play, arguing that the particular combination of music, game rules, and interactivity offers new perspectives for analysis. I draw on the concept of the *magic circle* to describe how games (re)contextualize meaning, allowing new meanings to develop through play. I also set the ground for my music analyses, considering music as a subjective, embodied experience that has the capacity to shape our thoughts, feelings, and therefore actions. Defining play as a cognitive process of learning, I nonetheless leave open a sense of possibilities—game play is indeterminate, even as music might shape it. Using an example from the video game *Final Fantasy IV*, I demonstrate a basic example of this kind of analysis, showing how several musical cues might shape the specific forms of play that game affords. The remaining three chapters dig deeper into various facets of this musical mediation.

Chapter 2, "Playful Encounters," explores the affective energies underlying the engagement between player and game, discussing the ways music contributes to and creates those energies. I position affect as a precursor for learning the logics of game environments, which are partially constructed by musical frameworks. I argue that music channels affective encounters with games through these frameworks, circumscribing what I call *affective zones*. In an example from *Super Mario World,* I show how musical tempo shapes the very same space differently, affording exploration in one space, suggesting speed of movement in another. In *The Legend of Zelda: A Link to the Past*, I draw on the referential and semiotic potentials of music, and offer an example of subversive play that goes against the "musical rules."

Chapter 3, "Playful Stories," broadens the scope to think about musical meaning across the ludic and narrative structures that typically comprise video games. I tackle the so-called ludic vs. narrative debate, arguing that music has gotten lost in the shuffle as a potentially significant factor in formal and structural approaches to video games. I discuss *Final Fantasy III* to show what I call *ludomusical narrativity* in play, as musical changes link with narrative changes to narrativize otherwise free-ranging play (while in turn linking to some problematic ideologies of music). I then turn to the more recent game *Journey,* which offers a case in which musical procedures are the primary source of narrative structuring, and that gameplay offers a new understanding of musical progression itself.

Chapter 4, "Playful Habits" continues to build on the theoretical frameworks from the prior chapters to discuss how players adapt to and inhabit games once they've reached the stage of what I call *habituated play*. Habituated play entails the player's mastery of the game's mechanics and narratives that were charted in the prior chapters. Even as music might be far from conscious attention at this stage of habituated play, I argue that this level of adaptation implicates musical meaning in special ways. Using conceptual blending theory, I show how players adapt to the game as a musical ecology when music blends with gameplay environments to create emergent meanings. In examples from *Bejeweled 3* along with a return to *Tetris, Super Mario World,* and *Final Fantasy IV,* I show how different species of play experiences lend themselves to this phenomenon.

I conclude by briefly considering the stakes of the dissertation beyond the video games themselves. Music offers a way for video game enthusiasts to extend the magic circles of games to encompass "real life" activities, providing a touchpoint for memory and experience that turns *meaning* into something *meaningful.*

Chapter 1
Playful Meanings: Music in the Magic Circle

Starting with Bach

In the video game *Final Fantasy IV*, the central villain, called "Golbez," is a dark and foreboding character with a similarly dark and foreboding musical theme (example 1.1).[1] Synthesized organ doubled by strings seem to plod about on chords that chromatically encircle E minor, then A minor. Then, in the B section, the texture changes—the strings drop out to leave an organ solo—and something familiar appears: a bit of the Toccata and Fugue in D minor, commonly attributed to J.S. Bach (BWV 565). More accurately, only the fugue subject appears in E minor, then repeated in B minor (a "real answer" if this were actually written fugally).[2] This Baroque excerpt is at home on the organ, but it is also at home in this context—the Toccata and Fugue (and several of J.S. Bach's other works) have historically played the role of capturing a kind of dark and spooky evil in the cinematic imagination, starting from the silent film era.[3] Golbez's mysterious and treacherous villainy seems to well suited for this musical meaning.

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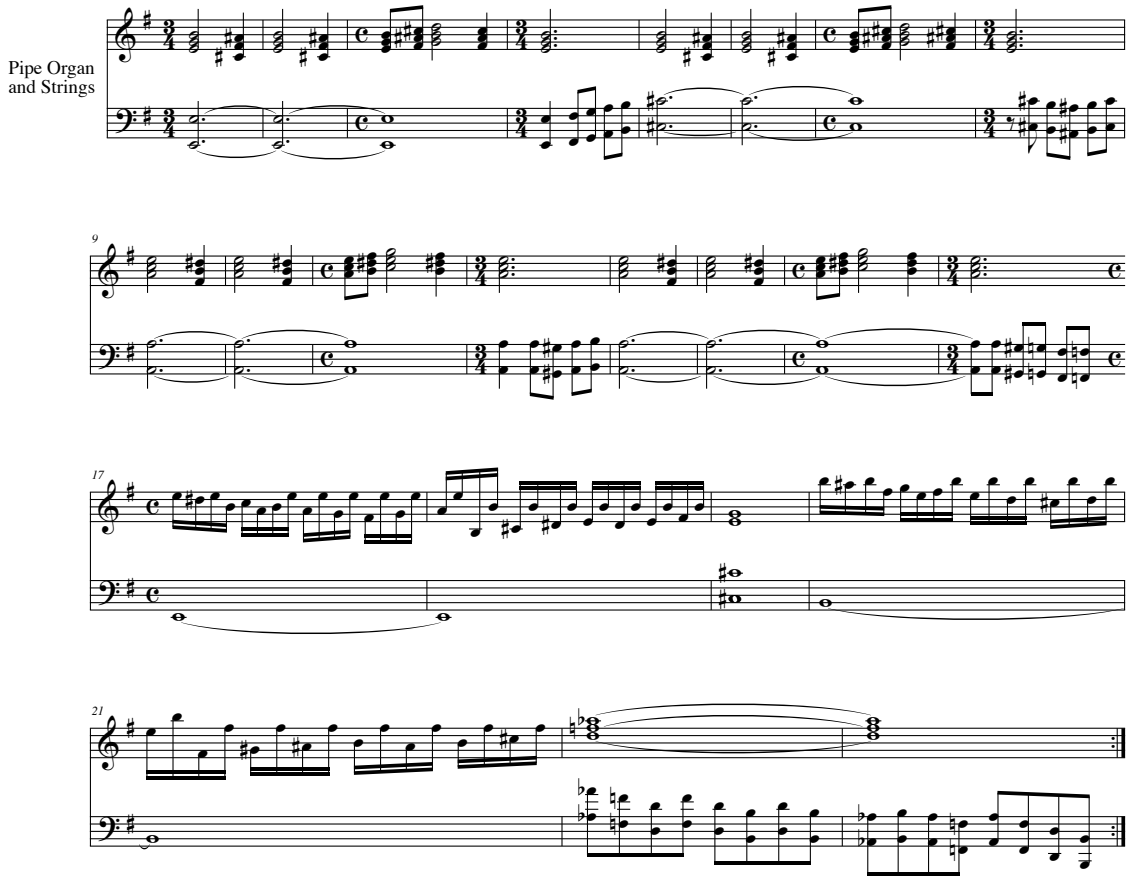
[1] Do not read this footnote if you do not want to be spoiled for the plot, but Golbez is secretly the protagonist's brother under mind-control by the true, more evil villain. (The creators of the earliest games of the *Final Fantasy* games frequently pay homage to *Star Wars* in their storylines).

[2] Uematsu would revisit the idea of an organ fugue in *Final Fantasy VI* (1994) by writing a prog-rock influenced track complete with a fugal segment for the final boss showdown, a track entitled "Dancing Mad."

[3] Dana Plank explores these references in "From the Concert Hall to the Console: Three 8-Bit Translations of the Toccata and Fugue in D Minor," in *BACH: Journal of the Riemenschneider Bach Institute*, Vol. 50, No. 1, 2019.



Example 1.1: Golbez's theme from *Final Fantasy IV,* featuring a near-quote from the Toccata and Fugue

Nobuo Uematsu, the composer for *Final Fantasy IV*, imports this kind of meaning through borrowing Bach's music, giving Golbez a vivid characterization that reaches beyond the particular mythical world in which *Final Fantasy IV* is set. This sort of characterization—not limited to actual characters, but to any aspect of virtual worlds—is one of the commonly noted

functions of music in video games, and in multimedia in general.[4] For one, music in "early" video games like *Final Fantasy IV* is often said to aid in worldbuilding when there were otherwise limited graphical capabilities to visibly portray characters, events, and settings. Compare Golbez in concept art in figure 1.1, with his graphical portrayal in figure 1.2.

Figure 1.1: Yoshitaka Amano's concept art for Golbez in *Final Fantasy IV* (source: videogamesartwork.com)

[4] Aspects of this dissertation are indebted to some of the groundwork of analysis that Nicholas Cook provides in *Analysing Musical Multimedia* (Oxford: Oxford University Press, 1998). Though the text is not directly applicable to video games, Cook offers a number of resources for conceptualizing what musical multimedia means and has the potential to mean.

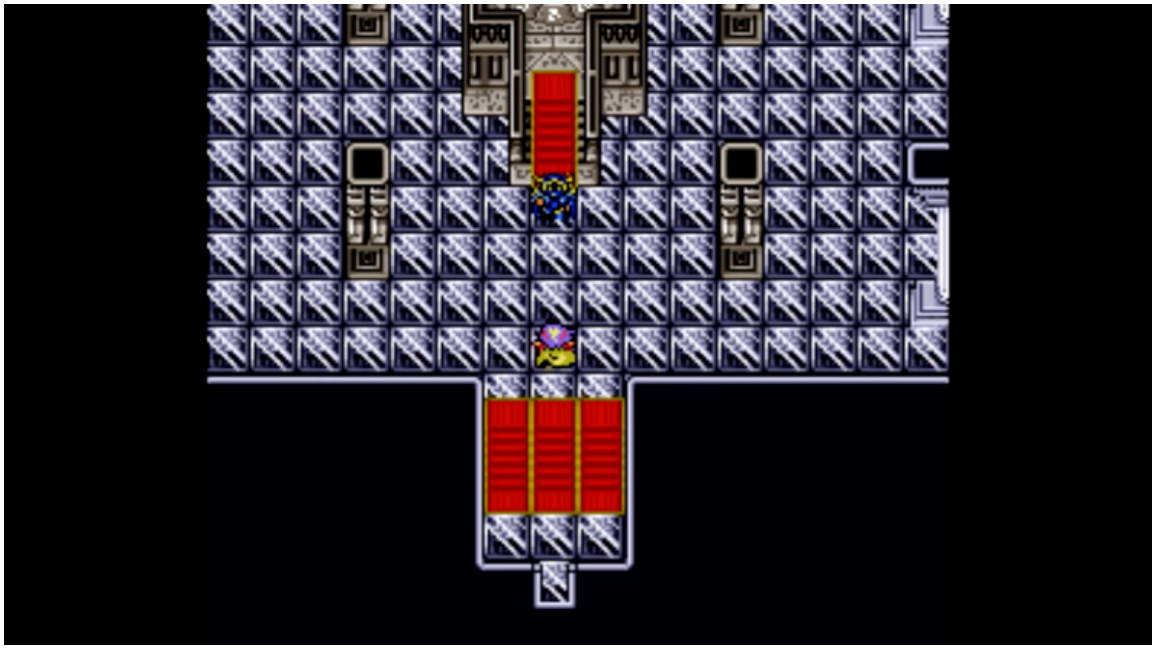


Figure 1.2: Golbez (in blue) as portrayed with 16-bit graphics of the Super Nintendo in *Final Fantasy IV*
(source: https://www.youtube.com/watch?v=2ZFMdm3oUeU)

Reciprocally, we could imagine how Golbez's character "exports" his own meaning onto the Toccata and Fugue. Someone who plays *Final Fantasy IV* and comes to know Golbez's plot might start to associate the Toccata and Fugue with evil, mind-controlling sorcerers from the moon with a tragic redemption arc (perhaps). Just as silent film, television, and cartoons set the groundwork for the spookiness of minor-mode organ fugues, video games, as broadly consumed narrative media, are poised to further contribute to broadening the scope of musical meaning amongst the listening—or playing—masses.

But what is particularly interesting about video game music is that such a circulation of musical meaning is mediated by *play*, a kind of engagement that is quite different from, say,

watching a film. To be sure, video games borrow heavily from cartoon and cinematic aesthetics in images, narratives, and the sounds that accompany these. But play allows for interaction—it allows a person or persons to see and hear virtual worlds, to understand them through their own lens of experience, and to act accordingly (or, not accordingly). Music like Golbez's theme might only be heard during a relevant character event. Or players might pause the game, interact with the game menu to adjust their characters' equipment, all while the music continues to play. Perhaps the theme colors not just Golbez's character, but also the player's actions; the theme's foreboding affect might encourage the player to make sure they are prepared for a tough battle. And of course, this is just one example from a game full of music, just one game of the many that encompass the multi-billion-dollar industry that now reaches *billions* of players across the globe.[5]

The use of Bach's Toccata and Fugue in Golbez's theme is not surprising. But much more potential for musical meaning unfurls when we consider the possibilities of play.

In this chapter, I take on each of the main themes of this dissertation in turn: video game music, meaning, and the possibilities of play. I begin by establishing the computational nature of video games, describing in basic terms the paradigms of musical cues in procedural systems. These paradigms form musical expectations, which function as part of what I call the musical "rules" for play. Building from the notion of musical rules, I turn to meaning, describing the concept of the *magic circle* of games and how music offers specific resources for meaning-

[5] The global video game market is expected to surpass 90 billion USD by 2020. In 2016, there were estimated 2.5 billion video gamers all over the world. See "2019 Video Game Industry Statistics, Trends & Data," *WePC* (last updated June 2019), https://www.wepc.com/news/video-game-statistics/.

making. Finally, I will describe how play is the mediating force that creates and uncovers such musical meaning, which in turn shapes the spaces of play.

Video Game Music: Codes and Procedures

Video games, running on computational systems, emerge from a set of procedures executed by a computer. (The "computer" in this case can be a personal computer, mobile device, arcade cabinet, or a dedicated video game console like a PlayStation; further possibilities exist.) These procedures start out as code, written in some programming language. Every video game, no matter how complex, can be boiled down to code—code that manifests the aspects of the virtual environment. Thus, the interactive interface of that environment is essentially a set of *if-then* statements that describe how users can interact with the system and what that interaction does in the virtual space. Studying how people interact with computational systems, or human-computer interaction (HCI), forms a field of study that deals primarily with interaction design, developed out of the rise of personal computing in the 1980s.[6] (Some of this dissertation borrows from this field, particularly in discussions of virtual affordances.)

Music and sound effects, too, are executed from code based on a given set of conditions. In *Pac-Man,* as the player tilts the joystick, Pac-Man moves accordingly, and makes his (now iconic) *waka-waka* sound. If Pac-Man is hit by an enemy, the spiraling "death" sound occurs.

[6] See "Human-Computer Interaction (HCI)," Interaction Design Foundation, accessed September 27, 2019, https://www.interaction-design.org/literature/topics/human-computer-interaction.

When the title screen appears and you've run out of money to keep playing, the arcade version triggers "attract" mode, playing a demo of gameplay to get another player's attention. As a distant comparison, the more recent game *The Legend of Zelda: Breath of the Wild* (2017) uses collections of piano cues triggered by variables more complex than those of *Pac-Man*, including the time of day in the game, whether or not the player's avatar is near an enemy, and certain special locations like towns and dungeons. To be sure, there are significant differences between the sound synthesis of early systems (such as *Pac-Man* in the arcade) and the dynamic, multi-layered audio of modern gaming (such as *Breath of the Wild* for the Nintendo Switch console). But this history of game sound technology is better dealt with elsewhere.[7] The essential takeaway is that, in video games, music is built on a certain set of rules that are set apart from whatever styles, genres, or tonal systems otherwise permeate the soundtrack. Every time *this* happens, *that* music plays. Or, *music plays until* X. Or, *this particular sound channel is added when* Y, etc. Music in video games is, at every turn, beholden to the computational architecture of the game.

But how do video games differ from, say, a desktop computer interface? As in games, certain sound cues only play when I interact with my computer in certain ways: I hear a crumpling paper sound when I empty my trash can, a more symbolic slap-bass sound when I press a key that has no effect, and so on.[8] For one, video games are typically far more musical

[7] See, for instance, Karen Collins, *Game Sound: An Introduction to the History, Theory and Practice of Video Game Music and Sound Design* (Cambridge, MA: MIT Press, 2008). See also her more recent documentary *Beep: A Documentary History of Game Sound* (2018).

[8] Elizabeth Medina-Gray gave a similar demonstration of auditory icons and "earcons" in computer desktops and video games in "Sound Effects as Music (or Not): Earcons and Auditory Icons in Video Games," paper presented at the North American Conference on Video Game Music (Fort Worth, TX: January 17, 2015).

than desktop computing. As described in the introduction, since the late 1970s, video games have followed earlier cinematic conventions to include a soundtrack of non-diegetic musical cues, often incorporated to loop endlessly during play. Of course, video games are more than video, they're also games—a form of regulated behaviors governed by certain rules and boundaries that have a stake on how that "background music" actually functions.

Games are rule-based systems of interaction, regardless of their medium. Games, even if designed to appear like a narrative film (as do several of the games of the *Final Fantasy* series), are nonetheless structured around challenges or goals that correspond with win- and lose-states (or, at least, progress-or-don't-progress). Games are often competitive, whether with other players or with the game itself. In *Final Fantasy IV,* Golbez isn't just a villainous character, he's also a challenge—players must fight him in battle using turn-based strategy, trying until they succeed (or give up). Regardless of narrative aesthetics, video games place game systems within computational systems, such that the rules of play are determined by the code of the game.

For example, let's first consider a simple video game based on familiar game rules. *Pong* (1972), one of the very first video games, is a table tennis (i.e. ping-pong) simulator, shown in figure 1.3.

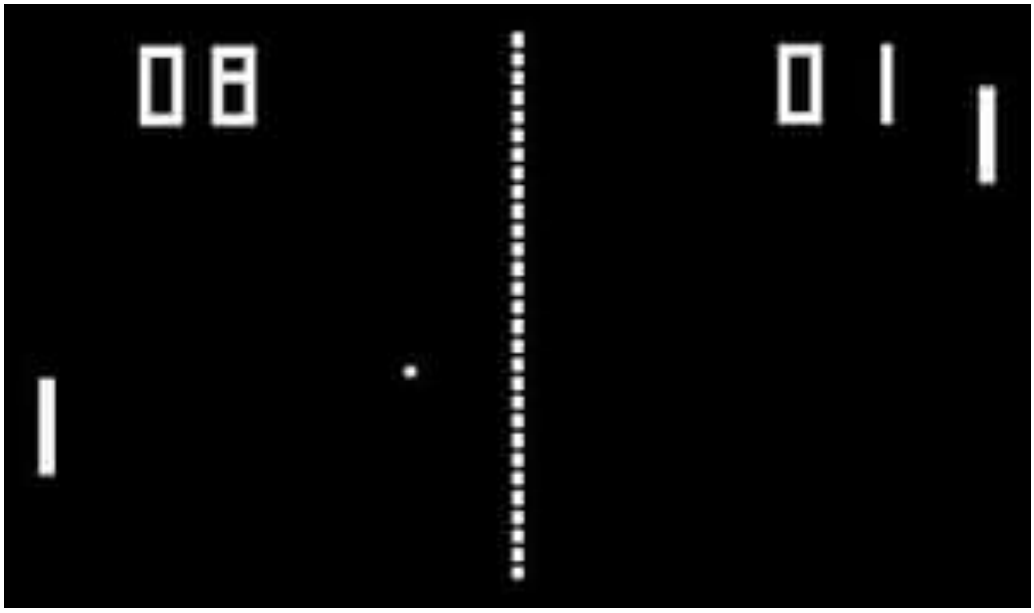


Figure 1.3: An image of the game *Pong* at a point when the player on the left has scored eight points (represented by 08 in the upper left) and the player on the right has scored one point (represented by 01 in the upper right). Player paddles are represented by vertical white lines at the leftmost and rightmost sides of the screen, the net is a central dotted line, and the ball is a small white dot to the left of center.
(source: https://www.theguardian.com/technology/2008/apr/17/games.atari)

The game rules of *Pong* are derived from those of "real-life" table tennis: use a paddle (represented by a short vertical line, moveable up and down the screen with a dial control) to "hit" the ball (represented by a white dot moving vertically and horizontally) across the net (represented by the dotted vertical line in the middle), hoping the other player (either human or computer) misses the volley, thereby securing a point. These simple rules are reflected in the code, which governs how input data (from the dial, for instance) changes game state, and how to output that data visibly on screen. Furthermore, these inputs and outputs are linked to simple *beep*-like sounds that provide auditory feedback for different species of events. One kind of *beep*

will occur when the ball hits a paddle, emulating the sound of physical impact. Another kind of *beep* (a *boop*, if you will) is heard when the ball hits one of the horizontal "walls," or the top and bottom edges of the screen. And yet another sound occurs if the ball goes past a player's paddle—a more symbolic emulation of a point gained. *Pong* thus provides a simple example of how computers manifest interactive game systems and their sounds.

The beeps and boops of *Pong* are its only sounds; the game was designed before background music was standard fare in video games.[9] In what follows, I turn to games with music, describing the paradigms of musical incorporation amidst game rules and computational procedures in video games. I offer a broad taxonomy of the types of triggers for musical cues, capturing how players might encounter such music within the code-based systems of games. Taxonomies and typologies are common in video game music theory, and several other scholars and composers have written about musical function with a far greater deal of nuance.[10] Here, I aim not to describe musical *function* but rather focus on the typical models of musical *incorporation*, particularly for readers who are not familiar with these paradigms. In this way, I loosely follow Tim Summers's approach in aiming to represent the musical "architecture" of a video game in terms of player encounter and perception, though Summers offers a great deal

[9] One might argue that the rhythmic nature of *Pong* is its own kind of music, particularly when the back-and-forth is accompanied by actual sounds. Kirk Hamilton offers an argument in "The Case for Video Games as Music," *Kotaku,* June 21, 2012, https://kotaku.com/the-case-for-video-games-as-music-5920350.
[10] See discussions of function in Winifred Phillips, *A Composer's Guide to Game Music* (Cambridge, MA: MIT Press, 2014); Summers, *Understanding Video Game Music*; Aaron Marks, *The Complete Guide to Game Audio* (Burlington, MA: Focal Press/Elsevier, 2009); Peter Moormann (ed.), *Music and Game: Perspectives on a Popular Alliance* (Wiesbaden, Germany: Springer, 2013).

more depth on the subject.[11] It is also important to note that these categories are not mutually exclusive, and rely simultaneously on design and perception—that is, it is important for the player to perceive a musical cue as location-triggered, for instance, no matter how the cue was designed.

A note on terminology: music for any given video game is typically termed its "soundtrack" within the industry. I refer to musical "tracks" only when considering them as such—for example, I might refer to Golbez's theme as the track titled "Golbez, Clad in Darkness." Otherwise, I prefer the term "cue," which captures a broader sense of the dynamic nature of video game music that the concept of "tracks" can obfuscate.

Location-triggered Music Cues

Video games that are set in explorable worlds tend to use differentiating cues to help define locations within those worlds. These cues trigger when the player enters or exits these locations, thereby connecting musical change with space and place.

In *Final Fantasy IV,* for instance, music heard in caves is different from that of towns, which is also different from that of castles, and so on. In this way, games can feature the same music for the different locations of the same type (e.g. towns), a paradigm common in earlier games with more limited hardware capabilities. If a player enters a town in *Final Fantasy IV,* even if she has never been to that town before, she can expect to hear "town music." These expectations create opportunities for music to significantly shape the player's understanding of

[11] Summers, *Understanding Video Game Music*, 13–25.

game worlds, particularly when music *defies* these expectations. For example, the town of Mysidia in *Final Fantasy IV* is distinguished from other towns by unusual music reflecting both the strangeness of the town and a pivotal point in the game's narrative.[12]

Location-triggered music provides an affective character to the area, often drawing on musical clichés or stereotypes to quickly orient the player to the nature of the location (and perhaps its denizens, whether friends or foes). *Banjo-Kazooie* is another world-based game of a different sort from *Final Fantasy IV,* an explorable "platformer" game with levels marked by aspects of climate, texture, and vague references to real cultures. The music for a beach-themed area, for example, draws on the connotations of steel drums, while sleigh bells are used in the snow-themed area.[13] As one might imagine, video games have frequently veered into more problematic musical exoticism, not without criticism. (Chapter 3 of this dissertation features one potential example.)

Event-triggered Music Cues

The "event" of event-triggered music cues can vary widely, but this encompasses music that triggers when *something happens within gameplay*. (By "within gameplay," I borrow from Tim Summers's terminology to refer to events that are considered by the player to occur "inside"

[12] It is at this moment that Cecil, the main character, is lost and alone on a strange shore. The music reflects both the weirdness of the town for the player (some of the townsfolk are talking animals, which is unusual for this game) as well as Cecil's inner state.

[13] Grant Kirkhope's score for the game exploits the potential of the Nintendo 64's capability to emulate a wide variety of instruments and timbres compared to its predecessor consoles. Each of these themed levels is accessed within a larger castle, but as you explore that castle, the theme changes instrumentation to reflect the worlds you might soon encounter. (This feature also occurs within the levels themselves.)

the environment, story, or world.)[14] These cues differ from location-triggered cues in that they are more closely linked with something *happening* rather than the *place* in which the event might occur. In other words, we could consider "entering a new location" to encompass a kind of event, but music that persists in that particular location is associated with the place itself rather than the crossing of its virtual threshold.

A short list of examples of event-triggered musical cues might include: changes in music when a challenger approaches or is vanquished, musical cues that accompany narrative "cut-scenes" (imitating aspects of a film score), a fanfare that occurs when the player acquires objects, musical changes when game time reaches a certain point (say, sunrise or sunset), or "diegetic" music heard by characters in-game (e.g. a group of characters singing). Often, the music of this category serves to call the player's attention to something, particularly if that "something" is dangerous. For example, in first-person shooters like *Bioshock Infinite*, music associated with battle might be heard before enemies are even seen; once the player has defeated all enemies in the area, the music typically ends or fades away, letting the player know they are safe. In other cases, such as time-based events like sunrise and sunset, music might operate more as affective ambience—in *The Legend of Zelda: Ocarina of Time*, a distinct musical phrase is heard at sunrise, followed by pervasive location-based music.[15] In the case of so-called "diegetic" music, or music that is presumably heard/produced by characters in the game, these examples mark "events"

[14] Summers, *Understanding Video Game Music*, 14.
[15] In *Ocarina of Time*, one could consider this cue to also signal the end of a particular danger, as nighttime is more dangerous (feature more enemy encounters) than daytime.

inasmuch as they are discrete instances of music-making. This includes characters singing (a frequent occurrence in *Red Dead Redemption 2*), music from in-game radios (*Grand Theft Auto* series), among others.[16] *Bioshock Infinite* is a demonstrative case of multifarious diegetic music that also notably draws from "real life" music, from the Beach Boys to Mozart.[17]

Task-triggered Music Cues

Sometimes music is most clearly associated with something the player has to *do.* Task-triggered music cues occur to accompany a player's actions during this task. Strategy, simulation, and puzzle game genres most often include music in this category. In the *Professor Layton* series, puzzles have their own musical cue, a kind of clock-ticking style of music that seems to promote cognitive speed despite there being no real time limits to solving puzzles. In *The Sims,* time stops when engaged in tasks of building a house or buying its furnishings, and appropriate music is triggered to accompany these tasks. This category also includes games in which tasks come with time-limits; for example, in match-3 puzzle game *Bejeweled 3,* "lightning" mode uses music that gets faster as time is running out. In the turn-based strategy series *Civilization*, these differentiations are less clear. Background music is a combination of task-based music, heard as players strategize their moves across a virtual game board, but one could also understand the

[16] See Kiri Miller, "Jacking the Dial: Radio, Race, and Place in *Grand Theft Auto,*" *Ethnomusicology* 52, no. 3 (Fall 2007): 402–438.
[17] See discussion of some of these instances in Gibbons, *Unlimited Replays*.

music to be evoking "location" in referencing the music of actual, real-world civilizations.[18] In the *Final Fantasy* series and similar role-playing games, battle music meaningfully separates the task of combat from the exploration of a location in which that battle occurs. This music, along with music for combat in the first-person shooters described above, can be an example of both event-based and task-based music—as much as it is linked with the *event* of battle, the upbeat, percussive nature of the music is appropriate for the task of fighting a bunch of bad guys.

For my purposes, the music of rhythm and performance games is also task-based, even though it is more fundamentally linked with gameplay itself than the examples previously described in this category. For example, games like *Rhythm Heaven* require the task of hitting the correct button at the correct time in the music, which would be considered task-triggered. Dance and performance games like *Just Dance* and *Guitar Hero* also feature music of this type, similarly requiring players to interact along the music as a score for action.

Music Cues Outside of Gameplay

In this grab-bag category, I include music that occurs "outside" of gameplay (in Summers's terms), which can encompass music for menus, the title screen, end credits, pause screens, character selection screens, and so on. For instance, *Mario Kart 64* features music for a title screen, for demo of gameplay, and for character and race track selection, all of which are outside the realm of gameplay itself: kart racing. While this musical category doesn't play a big

[18] Karen Cook discusses the rhetoric of civilization advancement through musical progress in "Music, History, and Progress in Sid Meier's *Civilization IV*," in *Music in Video Games: Studying Play*, K. J. Donnelly, William Gibbons, and Neil Lerner, eds. (New York: Routledge, 2014), 166–182.

role in this dissertation, such music is often thematically important, typically incorporating central musical themes as a cohesive frame around more variable gameplay music.

Musical Systems, Rules, and Expectations

By categorizing the paradigms of musical cues, I have set out a *systematic* understanding of music in video games—not only is music built into games systematically, but players also can *learn* the idiosyncratic system that governs music in a given video game. In other words, through play, players implicitly understand what music will occur, when it will occur, and perhaps where it will occur. I often refer to this systematic deployment of music as part of the constraints, boundaries, or logics of the game—musical rules. Just as play is otherwise bounded by interactive mechanics, virtual platforms, and numbers of lives, so does music form its own kinds of boundaries. As meaningful boundaries that constrain potential meaning, these musical rules are important to the theories of the dissertation.

Here, I am using the notion of system specifically to refer to the computational system on which video games are built. At times, this dissertation will reflect some aspects of systems theories, particularly *cybernetics*, broadly defined as the science of communication between human (or animal) and machine.[19] Cybernetics is typically concerned with feedback and control; thus, questions of how the machine systems of games (including music) might *constrain* player behavior resonate with cybernetics thinking.[20] In music, cybernetics is more of a philosophy

[19] Norbert Wiener, *Cybernetics: Or Control and Communication in the Animal and the Machine* (Cambridge, MA: MIT Press, 1948).
[20] See D. A. Novikov, *Cybernetics: From Past to Future* (Berlin: Springer, 2016).

(popular with some experimental composers) than a theory or method, and this dissertation considers systems only as understood as such. What I do *not* want to do is suggest that musical meaning in video games is itself systematic. Rather, I take an approach that sees the particularities of game systems as a framework. Even as I conceptualize music as *constraints* on play, these are equally a measure of possibility. The focus in what follows, then, is about how music accords the potential for meaning with the special resources music has to offer.

Meaning: Magic and Music

Game Meaning: The Magic Circle

I root my discussion of meaning in games in the concept of the *magic circle*, a fruitful term derived from game and play studies. The notion of a magic circle is used to describe how the activity of playing a game involves a tacit acceptance of the game's rules and procedures as *distinct* from those of every-day life. This distinction forms a hypothetical circle around the activity of play. The "magic" of the magic circle is the transformational process through which anything inside the circle is meaningfully recontextualized: objects, actions, communications, events (and so on) all take on new meaning inside magic circles.

This term came to modern game studies via Dutch anthropologist and historian Johan Huizinga, who in 1938 first used the term in the now-classic text *Homo Ludens: A Study of the*

Play-Element in Culture.[21] Huizinga argued that play is an underlying, universal feature of humankind (and animalkind) and the substrate of modern culture and sociality. The "magic circle" comes about through Huizinga's comparison of gameplay to various ritual practices throughout history, performed in some sort of consecrated space (e.g. religious worship).

Huizinga's original use of the term is a bit different from modern usage:

> All play moves and has its being within a playground marked off beforehand either materially or ideally, deliberately or as a matter of course. Just as there is no formal difference between play and ritual, so the "consecrated spot" cannot be formally distinguished from the playground. The arena, the card-table, the magic circle, the temple, the stage, the screen, the tennis court, the court of justice, etc., are all in form and function play-grounds, i.e. forbidden spots, isolated, hedged round, hallowed, within which special rules obtain. All are temporary worlds within the ordinary world, dedicated to the performance of an act apart.[22]

Whether a church or a chess board, these spaces circumscribe meaningful rules for objects, behaviors, and interactions. Since then, the term "magic circle"—essentially Huizinga's concept of playground—has become a central conceptual tool for understanding player interaction between the real and the virtual.

First, I'll describe how we can understand this transformative place where "special rules obtain" through a game that precedes video games. Figures 1.4 and 1.5 show a simple representation of the magic circle for the board game *Monopoly*. *Monopoly*'s magic circle gives the thimble, a sewing tool, two new and simultaneous meanings: as the player's position on the

[21] Johan Huizinga, *Homo Ludens: A Study of the Play-Element in Culture* (Oxford: Routledge, 1949). Translation of the 1938 Dutch edition. Page references are to the 2009 digital edition of the 1949 translation.
[22] Huizinga, *Homo Ludens,* 28.

board and, more magically, as the player's avatar in the "world" of *Monopoly* (in various parts of Atlantic City, NJ, and sometimes jail).[23]

Figure 1.4: A sewing thimble (left) and a thimble token in *Monopoly* (right) (sources: sipsnsews.com, cnet.com)

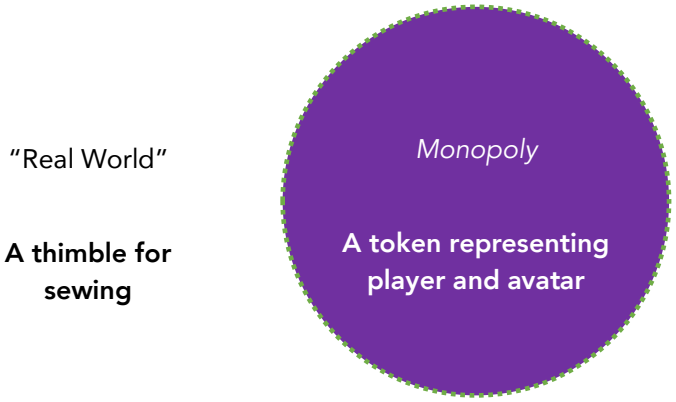


Figure 1.5: The "magic circle" of *Monopoly* gives the thimble, typically a sewing tool, a new meaning as a token representing the player's position on the board.

[23] Sadly, Hasbro retired the thimble and other classic tokens in 2017, replacing them with a T-Rex, rubber duck, and penguin.

Perhaps most notably, game designers and theorists Katie Salen and Eric Zimmerman center much of their work on the concept of the magic circle in their design handbook *Rules of Play*. Describing the magic circle as "where [a] game takes place," they further define this space as being one in which "special meanings accrue and cluster around objects and behaviors."[24] This definition importantly highlights the ways in which games not only recontextualize the meanings of objects and behaviors, but also offer potential for *new* meanings to accrue through play.

The potential for meanings to change and develop through play is central to this dissertation, and central to what music can offer for games. In many ways, video games make an even greater distinction between the magic circle and "real life" than sports or board games—video games exist behind screens that projects virtual spaces, often in entirely fantastical worlds.

Music Meaning: Experience, Embodiment, Subjectivity

In the introduction to this dissertation I mentioned that video game music is often referred to as "background music," presumably occupying a place away from the foreground of the game and the forefront of attention. Thus, players don't often *listen* to music during gameplay, at least in the ways that analysts might assume occurs in other kinds of musical experience. What I take to be the special experience of video game music is one that takes into account how musical materials are encountered, perceived, understood in the particular contexts

[24] Katie Salen and Eric Zimmerman, *Rules of Play: Game Design Fundamentals* (Cambridge, MA: MIT Press, 2003), 96.

of play. This is music that is *always* mediated—by the special meanings of the magic circle, by interactivity itself.

Magic circles might redefine meanings of objects like the thimble in Monopoly, but the object is still identifiable as a thimble (at least, to those who've heard of a thimble). Music can be understood similarly. Imagine if Golbez's theme from *Final Fantasy IV* were an entire 16-bit version of Bach's Toccata and Fugue, rather than a cue that simply borrows the fugue subject for a moment. In that case, Golbez's theme would still be Golbez's theme, but would *also* be identifiable as the Toccata and Fugue (at least, to those who've heard the Toccata and Fugue). Of course, in *Monopoly,* the thimble is a special token with specified meanings. These meanings don't preclude playfulness, of course (who among us hasn't ignored some of the rules of *Monopoly*?). But even so, the thimble's specified use as a game token is reified through typical play. In *Final Fantasy IV,* you won't find a game manual that tells you how to use and interpret Golbez's theme. A typical playthrough of *Final Fantasy IV* will solidify some meanings (Golbez's theme becomes quickly identifiable as his theme), but players are otherwise free to experience music as they will. Put another way: it would be strange and untypical to use *Monopoly*'s thimble as a sewing tool while also playing *Monopoly.* No such rules of typicality exist for musical interpretation. Understanding Golbez's theme as Bach is not subversive or strange for the purposes of gameplay. The magic circle allows "background music" freer passage between the real world and a game's magical bounds.

Music thus has a special role in video games—it can bring external meanings into play, and can leave the game with a new set of meanings. Persisting with the thimble analogy, we can easily imagine someone seeing a sewing thimble and thinking of the game *Monopoly*. But might they also use that thimble for sewing and be flooded with *Monopoly*-specific memories? Most likely not. Music, on the other hand, carries those experiential meanings with it more readily. (I always hear a little bit of Golbez when I hear the Toccata and Fugue, particularly due to having played *Final Fantasy IV* at a young age, and quite a lot.)

The capacity for us to experience music as having associated memories and experiences is one basis of the arguments in this dissertation. Some of the meanings that music can carry are referential, as in the case of Golbez's theme. Music can directly or indirectly reference other music, other games, other media, through quotations or even just stylistic resonances. As video game genres start to see musical conventions coalesce, several scholars have analyzed games as sources of new musical topoi.[25]

Along with referentiality, music is also meaningful in a more directly experienced way. Much of this dissertation—and much of music analysis—takes as an assumption that music is experienced through the unfolding of time. In this way, music perception is a matter of experiencing a sequence of events, a conception of music that underlies David Lewin's

[25] See, for instance, Sean Atkinson, "Soaring Through the Sky: Topics and Tropes in Video Game Music," *Music Theory Online* 25, no. 2 (July 1, 2019), http://mtosmt.org/issues/mto.19.25.2/mto.19.25.2.atkinson.html.; At the North American Conference on Video Game Music in March 2019 (Hartford, CT), Thomas Yee discussed the creation of particular topics in battle music. "Battle Hymn of the God-Slayers: Troping Rock and Sacred Music Topics in *Xenoblade Chronicles* (2010)."

phenomenological approach and other studies of music perception.[26] The temporality of music is also understood as a basis for the perception of musical emotions, to an extent that we could consider music perception as an embodied experience that guides the mind in imagining a number of potential sensorimotor processes associated with music.[27]

But again, the presupposition of these kinds of analyses is a direct engagement with music, not the heavily mediated experience of playing video games with music. Nonetheless, we can still consider musical experiences in games in these familiar terms. Taking a single cue as a unit of analysis, we could analyze tempo in coordination with gameplay to consider how musical speed influences affectual feelings, an approach I take up in chapter 2. On a broader scale, we could think of how formal syntactic structures of music over the course of play can correspond with narrativity, an approach I take up in chapter 3. Music itself might be considered "background," but it is these interactions with gameplay which foreground experiences that happen to be quite musical.

Returning to the computational nature of games, I posit that musical meaning is further implicated in the systematized nature of music's deployment. When players adapt to these systematic aspects of the music, they solidify the associations, expectations, and memories that music then can carry with it beyond play—an approach I take up in chapter 4. These musical

[26] David Lewin, "Music Theory, Phenomenology, and Modes of Perception," *Music Perception* 3, no. 4 (Summer 1986): 327–92.
[27] Much of David Huron's work investigates temporality, expectation, and musical pleasure. See *Sweet Anticipation: Music and the Psychology of Expectation* (Cambridge, MA: MIT Press, 2007).
Lawrence Zbikowski discusses how music temporality simulates states of emotional progress in "Music, Emotion, Analysis," *Music Analysis* 29, no. 1–3 (March 2010): 37–60.

systems do not determine meaning, but rather form a virtual ecology that blends sights and sounds with the rules and logics of the game. This ecology is a substrate for meaning-making, as players adapt to gaming environments with the musical subjectivity they bring to play.

The Possibilities of Play: How We Interact with Video Games

In this section, I discuss play and interactivity in virtual worlds, emphasizing both the constraining features of video games and the ambiguous nature of play. Huizinga defines play in *Home Ludens* as "a free activity standing quite consciously outside 'ordinary' life as being 'not serious,' but at the same time absorbing the player intensely and utterly."[28] One can play without necessarily *playing a game.* Indeed, a *game* can certainly be conceived as quite serious and having real-life implications, as in the case of professional sports games and betting games. Nonetheless, the term "play" carries with it aspects of experimentation, exploration, role-play, facetiousness, and silliness.

Playing in "real" life allows us to see the world in a different way from what is typical and ordinary. Because video games are already set apart from real life by virtue of virtuality, play is a way of uncovering what is extraordinary in a system already built to allow play. In a way, then, video games are paradoxical—to interact with them *as designed* is still called "play," even if this is a rather encompassing definition that views any kind of interaction as a form of playfulness. But because video games are *already* built upon the inherent playfulness of alternate worlds, logics,

[28] Huizinga, *Homo Ludens*, 30.

physics, and roles, I argue that such interaction is inherently a form of play. (Nonetheless, in subsequent chapters I discuss how play can be subversive or antagonistic amidst game rules *and* music.)

Perhaps video game play is closer to a kind of play that music scholars are quite familiar with—playing music. To make sound out of an instrument, for instance, is to interact with a physical device that has its own system of interactive affordances, like a game system.[29] Furthermore, to read notation and interpret that notation into sounds is one way to read and interpret a set of codes or rules. I "play" the clarinet, and maybe today I feel like playing Schubert's song *Der Hirt auf dem Felsen*. I'm taking the clarinet and enacting its interactive affordances, transforming objects into agents of musical activity, in ways specified by Schubert. There are many ways in which I can succeed or fail, and I have discovered many of the latter. I am not a skilled enough player to get through the final *brilliante* measures of arpeggiating flourish without "cheating" in some way—adding extra slurs, skipping a note to breathe. The musical score provides prescriptive notation for a player to render the clarinet part of *Der Hirt*, much like a level of *Super Mario Bros.* might demand certain actions to complete the level.

Music analysis is also a form of play—it's a kind of indulgent, pleasurable activity (for music theorists, anyway) from which only the lucky ones can make money. Analysis can change our relationship to the music, hopefully in positive ways. Uncovering patterns and structures that

[29] For more on instrumental affordances, see Jonathan De Souza, *Music at Hand: Instruments, Bodies, and Cognition* (New York: Oxford University Press, 2017).

are particularly striking in some way seems similar to finding a shiny object in the corner of the dungeon that one might have missed on first pass. Analysts do the task of mapping music's hidden passageways and shiny treasures for the listener, offering a strategy guide to a particular kind of hearing (or composing, or performing). I could go on and on with these analogies, but the point is that we are already familiar with the sense of play as a transformative action in its relationship to music and sound.

There are probably no fewer than one hundred-gazillion definitions of "play" out there, one of which might include my use of "gazillion." But in the context of this dissertation, I take a rather liberal approach: to *play* a video game is to interact with the game as a system of rules and procedures for that interaction.

Play as Cognitive Process

In order to account for that *transformative* element of play, I take a cognitive approach to play as a process of learning. Video games offer a curious case for thinking about cognition; they themselves simulate a model of cognition inasmuch as they emulate alternate environments for new sensorimotor possibilities. Consider the classical set-up for playing a video game: player holds controller, controller (an input device mapped to an avatar) hooks up to game console, console projects game onto screen, and screen displays both a virtual world and a user interface that portrays information like items, maps, and status of the character.[30] The conceit, of course, is

[30] Of course, this is just one of many kinds of ways to play video games. Computer games often use a keyboard as a controller, and motion-sensing devices eschew the need for a controller, for instance.

that the *player is the avatar is the character*. Being in the world, adopting new environmental paradigms with particular interactive affordances, involves a necessary extension of the bodily self into a world on screen. Several concepts discussed in this dissertation are informed by theoretical approaches to embodied cognition that offer entryways into the process of playing a video game, but I take "embodiment" to not necessarily relate to a true feeling of corporeal immersion. After all, *Pong, Pac-Man, Super Mario Bros,* and *Final Fantasy IV* do not create the illusion that the player is *really* in the world—these are decidedly not the Virtual Reality (VR) games that are so immersive as to potentially cause motion sickness. My assertion that interaction is a form of cognition is drawn from approaches to cognition that "outsource" processes of knowing from the confines of the corporeal body—perhaps to an avatar on screen. This approach also widens the scope of analysis for a consideration of the diversity of physical and mental subjectivities that frame player encounters with an environment, rather than relying on an ideal listener in an ideal body.

The idea of an extended, out-of-body cognition emerged in the 1990s in an article by Andy Clark and David Chalmers.[31] Such an "extension" broadly refers to cases of an individual's environmental interactions, when "the human organism is linked with an external entity in a two-way interaction, creating a coupled system that can be seen as a cognitive system in its own right."[32] It was an approach motivated by a need to understand learning in virtual environments

[31] Andy Clark and David J. Chalmers, "The Extended Mind," *Analysis* 58 (1998), 10–23.
[32] Clark and Chalmers, "The Extended Mind," 8.

given the rise of digital computing, but also reflects broader ideas about any kind of external interactions in an environment. Using the game of *Tetris* as an example, Clark and Chalmers argue for extended cognition in game spaces, specifically. In their account, rotating falling geometric shapes to fit a slot is not just an interaction, but also a process of determining whether or not the shape can fit.[33] They term this rotation interaction an *epistemic* action that, in the environment of *Tetris,* augments cognitive processes of learning and knowing. In this way, cognition is extended beyond the skin and skull, and into the simple four-square *tetrominoes* that comprise a kind of player "avatar."

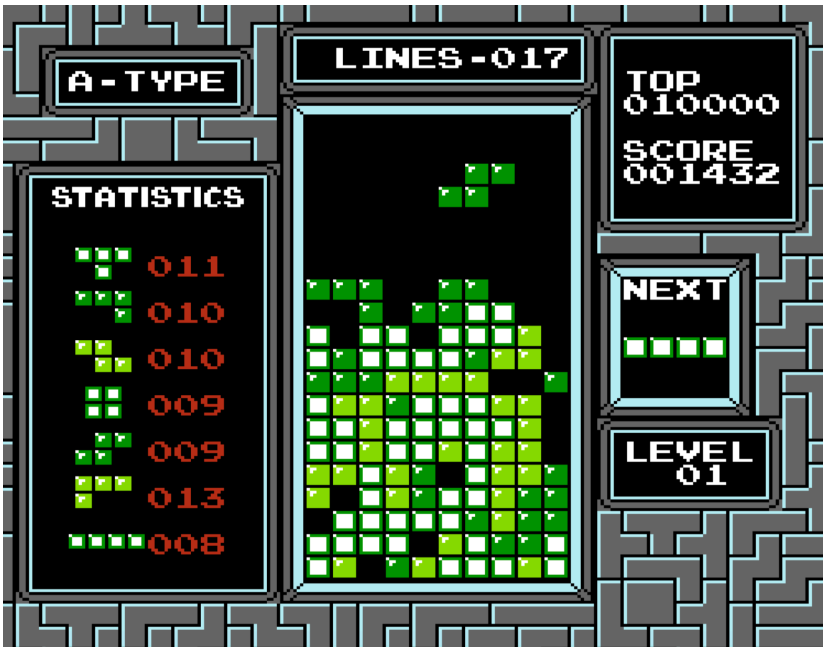


Figure 1.6: *Tetris* (Nintendo Entertainment System, 1989 version)

[33] Clark and Chalmers, "The Extended Mind," 8.

As another example, in *Final Fantasy IV,* the screen might show characters fighting off a monster—this is the manifestation of the player pressing buttons to engage in interactions of *fighting*: wielding a sword, evading attacks, casting magic, and so on. Similar to the rotation of blocks in *Tetris,* these interactions comprise a process of testing the logic of the environment, an implicit means of asking questions about cause and effect: *Is this enemy immune to magic? How many sword strikes does it take to kill this monster?* The player can very well find the answers to these questions by asking others or by consulting a strategy guide. But this kind of knowledge is also implicit—by performing these interactions, we engage in procedural learning of games, of the rules that govern the environment, and what winning and losing actually entail.[34] Part of this procedural learning involves the experience of music—hearing the music that triggers during battles is itself one of the rules of the environment. It is a rule created and enforced by repetition and invariance. The musical cue for battle is something to expect when encountering enemies, as much as one similarly expects consistency in graphic design, patterns of enemy movement, or the fact that pressing the "left" button results in characters moving leftward on the screen.

Because video games offer conditions for success and failure in the ways players interact, "learning" in virtual environments is linked to affordances for interaction. Most theories of affordances in games reflect Donald Norman's approach to interaction design, based on an

[34] I use the term "procedural" generally to mean the process of learning that, through active repetition, leads to the formation of skills and habits; this is usually connected with the motor system. (See the entry on "Procedural Learning" by Leonard F. Koziol and Deborah Ely Budding in the Encyclopedia of the Sciences of Learning (2012), pp 2694-2696.) This differs from other uses of procedurality in video games, often to refer to computational procedures, or to rhetorics of procedurality (see chapter 3 of this dissertation).

assumption that people naturally perceive ways to interact with objects through the design of those objects.[35] To clarify this concept in virtual space, I'll turn to a clearer example from *Super Mario World.* As a "platformer" game, *Super Mario World* features obstacles in vertical and horizontal space, challenging the player to move past these obstacles toward an end point. Interactions primarily comprise different forms of movement over, under, around, and through these obstacles via Mario, the player's Italian plumber avatar. *Super Mario World*'s spaces, termed "levels," are outside, underground, in dungeons, in the sky, and in the stars. Such topological variety affords movement that explores the space, revealing the potentials of the environment through movement through it. For example, a player might see a treasure suspended in mid-air and out of reach of Mario's jumping radius, but close to a platform that is accessible (figure 1.7). The monster on the platform assures the platform's solidity and thus its affordance for jumping-onto. This configuration of obstacles teaches the player to take advantage of vertical space, by offering an incentive but also embedding that knowledge into memory. Through interacting with this environment, the player not only solidifies her perception of those affordances, but also participates in revealing more of the level by her movement through it. Furthermore, prior interactions in *Super Mario* environments might lead her to hit her avatar Mario's head on the underside of the block, where items might emerge. (Such an interaction isn't inherently afforded by any logic we could apply from the "real" world but rather reflects the procedural learning that imbues environments with game-specific affordances.)

[35] Donald A. Norman, *The Design of Everyday Things.* New York: Basic Books, 1988. Reprinted in 2002.

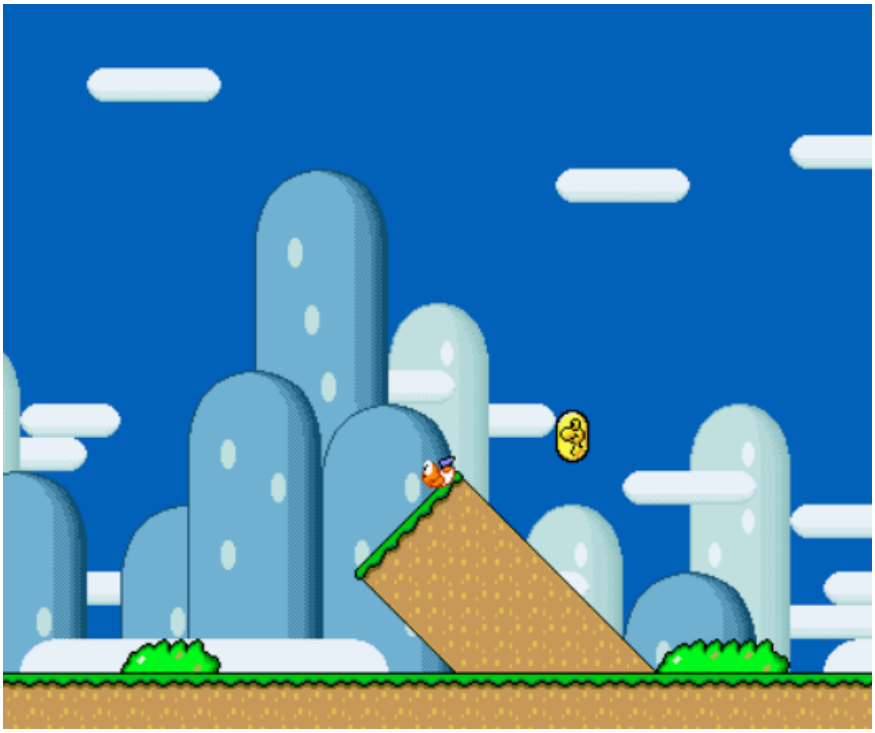


Figure 1.7: The beginning of the level "Yoshi's Island 1" in *Super Mario World* (source: mariomayhem.com)

Affordances for interactions might also map onto music. Characterizations of musical affordance tend to run the gamut of possibilities, from meter affording bodily entrainment, to acousmatic sounds affording leaps of interpretation.[36] These approaches are largely adjacent to or reliant on embodied cognition perspectives on musical experience, inasmuch as perception involves bodily responses and primes bodily action. On the whole, I refer to these bodily responses and the potentials that arise as examples of musical affect, and specify the concept of affordance for interactions within the game environments. I allow for music to map onto

[36] W. Luke Windsor and Christophe de Bézenac, "Music and affordances," *Musicae Scientiae* 16, no. 1 (2012), 102–120.

environmental affordances such that, for example, music might afford the player's interaction of Mario jumping while such an interpretation might not be tenable in relation to the player's physical body. Such a disjunction does not preclude musical relationships that seem to map easily between the player's body and the avatar's body. (Consider the necessary in-game musical entrainment that forms the mechanics of rhythm games, for example.) But environmental affordances in games are often created from unique rules and physics that implicate music in novel ways. In *Final Fantasy IV,* we might hear battle music, with its progressive rock style and persistent percussive texture, as affording "fighting" through analogous relationships between "attacks" both physical and musical. But it is important to emphasize that the relationship between music and interactive affordances is complicated by the physical affordances for interaction in game space that do not necessarily rely on sound, a complication that underlies my motivation for taking an approach that considers music as suggestive rather than determining.

As much as game designers can aim to direct players one way or another, indeterminacy reigns: *What will the player do in this space? How long will she take to find the path forward? What if she decides to use* this *item on* that *object*? Video game designers account for different potentials for interaction while providing positive feedback for the "correct" actions in the form of new pathways, gained objects, or progressing plot.[37] The player's perspective operates a little differently—while elements of the environment (including music) offer affordances for

[37] Progress indicators are ways of building a kind of narrative in video games. (See chapter 3 of this dissertation.)

interaction, it isn't until those interactions are *enacted* that the environment is revealed, including whatever rules and logics govern interactions. Video game environments become known through interactions that allow them to be revealed in both a literal sense (progressing forward to see the next screen) and also a conceptual sense that relates to the learning processes of play. Interacting with environments enables the player to encounter and understand the rules and boundaries of those environments, including those prescribed by musical parameters—it is through interactions, whether they are exploratory in *Final Fantasy IV* or feats of athleticism in *Super Mario World,* that uncover the scope of music and the systems it is bound by.[38]

To further ground a discussion of interaction, I'll turn to common parlance. Game designers and players alike use the term *mechanics* as a means to organize interactions by their functional hierarchies in a game or genre of games. In an extensive account of the features of game design, Katie Salen and Eric Zimmerman use the term "core mechanic" to describe "the essential play activity players perform again and again in a game" out of which patterns of player "activities" can emerge.[39] Focusing on the interfaces between body and play, Patrick Jagoda and Peter McDonald define mechanics as "the set of techniques for interacting with a game world, which are arbitrarily mapped through an interface to player gestures, and are both constrained and enabled by a game's platform, whether it is a PlayStation 4 console or an analog game

[38] For a visualization of interactive affordances in video games, see Ian Bryce Jones, "Special Effectivities," *[in]Transition: Journal of Videographic Film & Moving Image Studies* 6, no. 3 (2019), http://mediacommons.org/intransition/special-effectivities.
[39] Salen and Zimmerman*, Rules of Play,* 316.

board."[40] For example, in the game of Tag, *chase* is a core mechanic (out of which actions of *running, evasion,* etc. emerge), while tagging is the goal that motivates the chase (and often the transitional state to the next round). In more complex play as in video games, multiple kinds of mechanics can emerge to take precedence within different environments in the same game. In most of the *Super Mario* games since the first *Super Mario Bros.* (1985), *run* and *jump* are two kinds of interactions that make up the core mechanics of overcoming platform obstacles, while *jump* also doubles (with actions like *punch*) as part of the mechanics of overcoming enemy obstacles like Goombas and Koopa Troopas.

These mechanics define the kinds of interactions that the player adopts through her avatar, a means of exploring and understanding these environments as a practice of extended cognition. Through consistent audiovisual feedback, the player not only learns the proper mapping of "button-to-action," but also what that interaction means in context. If "jump" is mapped to the "B" button, pressing "B" consistently results in the avatar (Mario) jumping, alongside an analogous sound effect to reinforce the connection.[41] Through experimenting with such an action, the player comes to learn the particular ways in which jumping means progress (gaining spatial distance in a level) or enemy attack (jumping on a Goomba's head squashes the poor fellow dead). Through this process of interacting and learning, she also "gets good at the

[40] Patrick Jagoda and Peter McDonald, "Game Mechanics, Experience Design, and Affective Play" in *The Routledge Companion to Media Studies and Digital Humanities*. Sayers, Jentery, ed. (New York: Routledge, 2018), 176.

[41] Haptic feedback in the form of controller vibration became another option in console controllers the mid 1990s. Further, Nintendo's Wii Console (first released in 2006) incorporated small speakers on its controllers, allowing certain sounds to emanate from the player's hands.

game" not just through adroitness at the controls, or even the conscious knowing of pitfalls, but also through an implicit understanding of the affordances of the environment that privilege certain interactions over others. These are the cognitive processes inherent in play.

Let's Put it in Play

To conclude, I'll return to *Final Fantasy IV,* moving beyond Golbez's theme to briefly demonstrate some of the concepts described in this chapter.

In *Final Fantasy IV*, the primary goals follow a narrative awfully common in video games: exploring a magical fantasyland, which is full of monsters, in order to save the world. Within this narrative frame, players control a group of characters (the "party") throughout dangerous spaces, exploring to find treasures, sometimes being randomly plunged into turn-based strategic battles to dispatch enemies. (This paradigm is modeled from earlier tabletop role-playing games, most prominently *Dungeons and Dragons*). A life gauge, in the form of health points, indicates how close the characters are to death, which leads to a *Game Over* for the player—they would have to start a challenge over again. This paradigm, with progressive challenges based in exploration and sheer violence, is typical of video games of this type, and is more or less the backbone of even highly complex modern action-adventure and role-playing games today.

In the process of play, players learn about actions, consequences, and rules. Players also learn how this broad "magic circle" can be subdivided by music that circumscribes its own meanings for play. For instance, caves encompass winding, dark labyrinths (figure 1.8), and use a

particular location-triggered cue (example 1.2) that seems to reflect these aspects with free-floating harmonies and winding, chromatic melody.

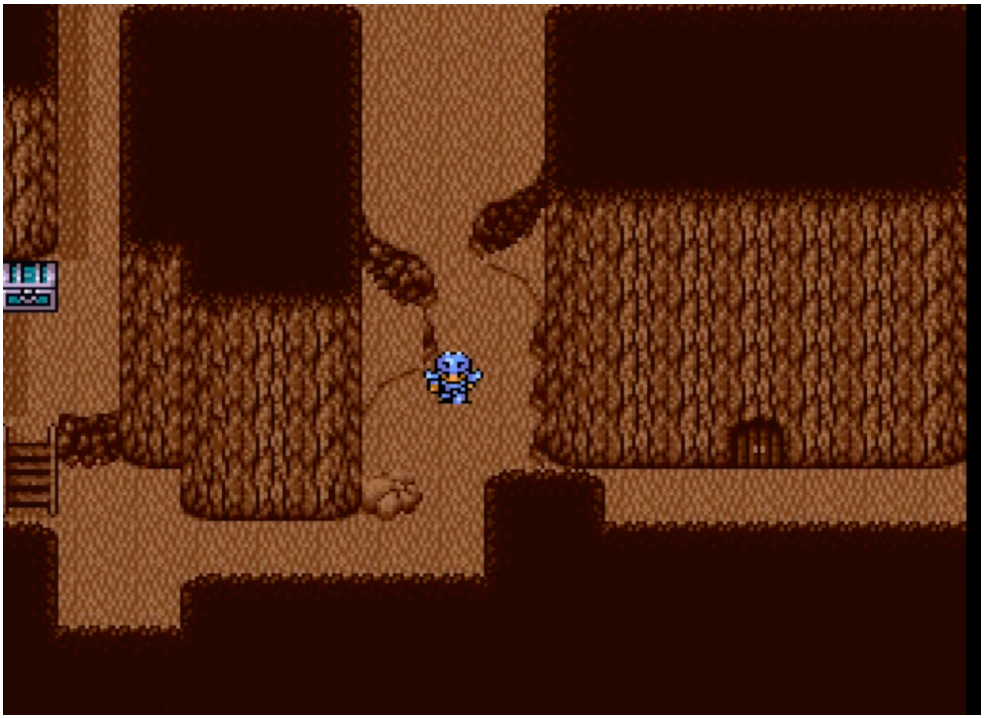
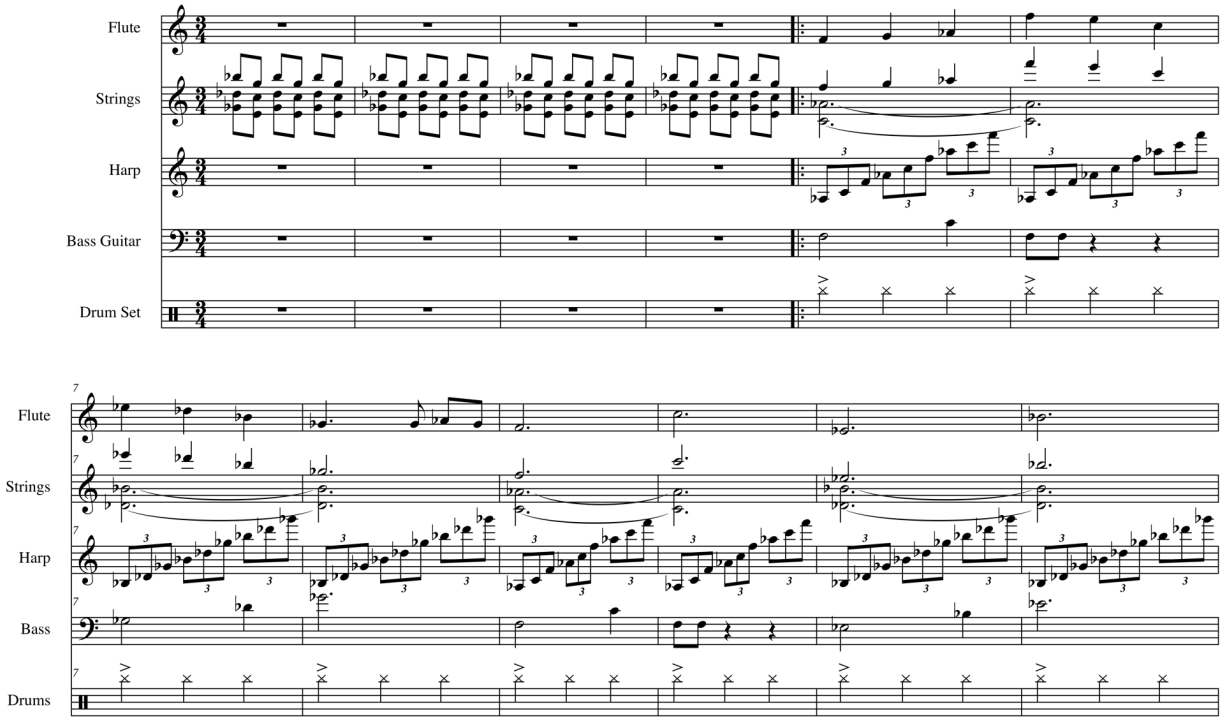


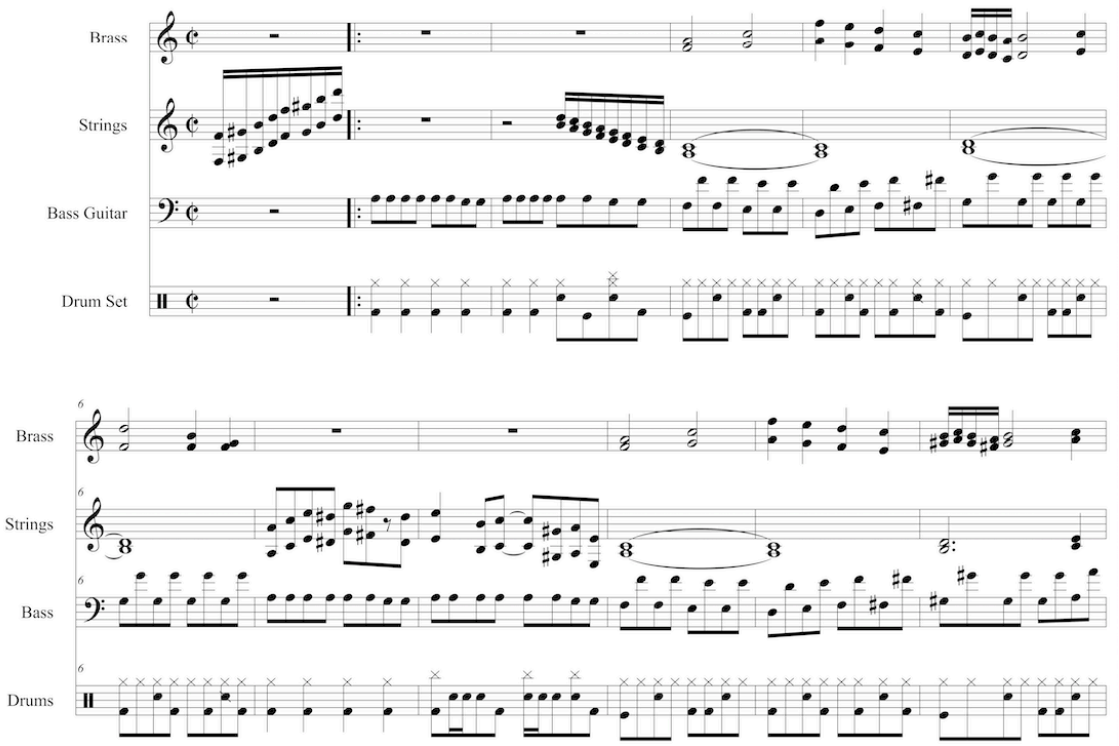
Figure 1.8: A cave in *Final Fantasy IV*



Example 1.2: Cave music in *Final Fantasy IV* ("Into the Darkness"), mm. 1–12.

Within the caves, however, enemies abound (figure 1.9)—encountering them brings about the event- and task-triggered cue of battle music: an upbeat, percussive, rock/disco-influenced cue (example 1.3). Even though players are still in the cave, music meaningfully separates two different modes of play.[42]

[42] Elsewhere, I have described how these musical cues can frame different temporalities of play: "Music in the Time of Video Games: Spelunking *Final Fantasy IV*," in *Music in the Role-Playing Game: Heroes & Harmonies*, William Gibbons and Steven Reale, eds. (New York: Routledge, 2019), 97–116.



Example 1.3: Battle music from *Final Fantasy IV* ("Fight 1"), mm. 1–11.

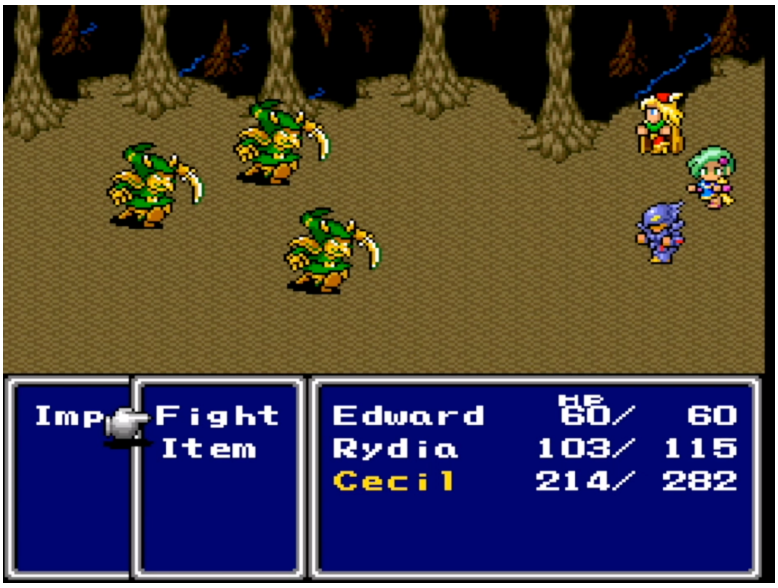
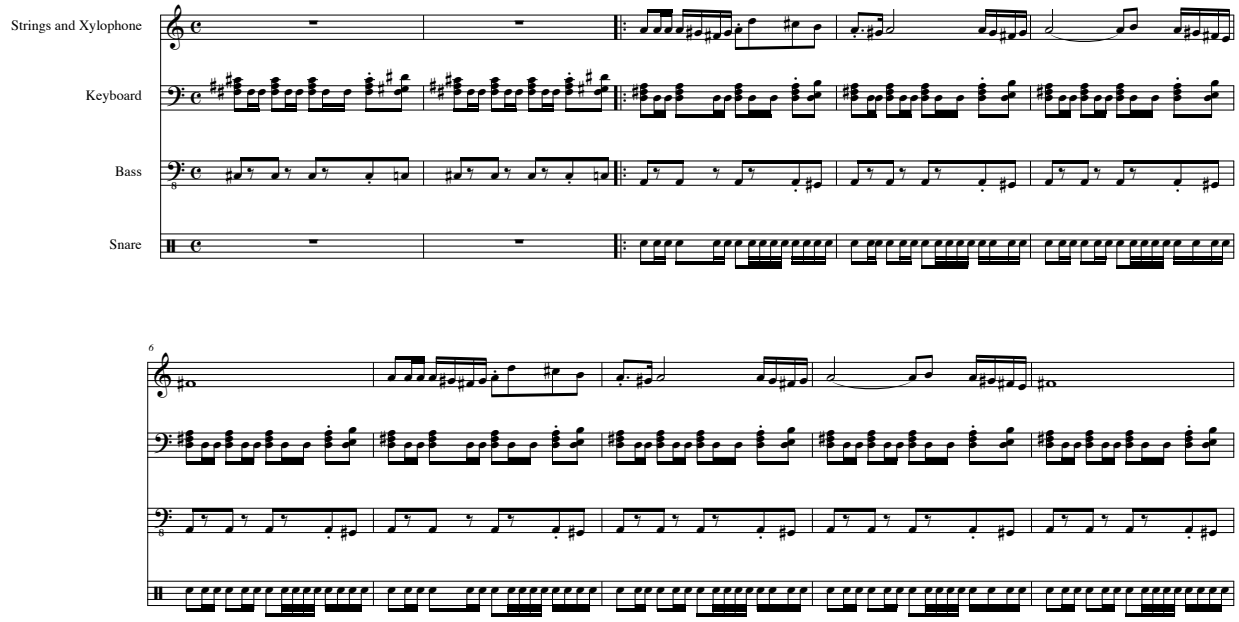


Figure 1.9: Battle in *Final Fantasy IV*

Between cave exploration and battle, the mechanics of play are different, and we could consider music as somewhat overdetermining of these differences. But let's consider two different locations with the same mechanics of play. Example 1.4 shows the music for mountain exploration, shown in figure 1.10. This music plods heavily, more percussive and insistent in its rhythms, tethered to the ground.

Mountains are different from caves, to be sure, and it makes sense that Uematsu would compose different music to affectively color these two different locations. Nonetheless, the mechanics of play between caves and mountains are the same: explore a labyrinthine maze, encountering enemies (and their battle music) as obstacles along the way.



Example 1.4: "Mt. Ordeals," *Final Fantasy IV*, mm. 1–10

Figure 1.10: A mountain in *Final Fantasy IV*
(source: https://strategywiki.org/wiki/File:FF4_WT_4d.jpg)

The ways in which music captures our feelings, our sense of time, even if not our direct attention, can shape the way we play through mountains and caves. Players might approach caves with more trepidation than mountains, feeling the harmonic and melodic unease. Players might approach mountains with a particular concept of *difficulty*, given its ostinato-like accompaniment that doesn't seem to budge from its persistent hammering. Once players learn these musical associations, perhaps they develop a richer set of game-specific connections: caves with mythical monsters, mountains with personal trials. It might take the experienced player more time to consider the *floating* associations of cave music and the *restrained* associations of

the mountain as actually quite ironic. But these are the resources of music—to offer potentials for meaning in multifarious ways, shaping and being shaped by play in virtual worlds.

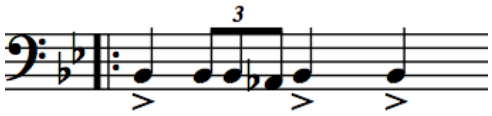
In the next chapter, I take up *affect* more directly, demonstrating how music shapes play through shaping our thoughts and feelings in video games. How might background music not only bring meaning, but also affect the *mood* of a situation? And how might that mood change what certain interactions mean in game spaces? As I'll show, the affective potentials of games are enriched by particularly musical bounds that lead players into new kinds of magic circles.

Chapter 2
Playful Encounters: The Affective Zones of Video Game Music

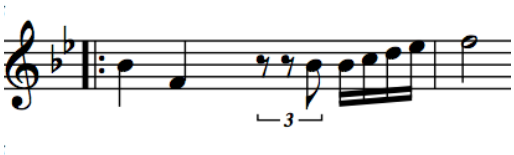
Feeling, Knowing, Playing

Swinging wildly at soldiers from an enemy army, a boy tries to defend himself in a chaotic attack on the open field. Three hearts, two hearts, one, then none, and everything goes black. No hearts; you're dead.

Restart. *Dun-dundundun-dun-dun* sounds the familiar *ostinato* groove pattern in the low brass (example 2.1). The trumpets, in a fanfare, ascend as expected (example 2.2). The enemies are back again, too—but this time, the boy will succeed, because you've learned to notice the pattern in enemy movement, itself an ostinato groove to which you have now entrained.

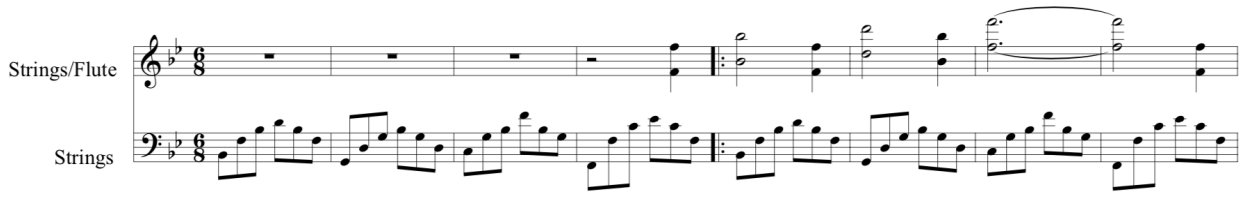


Example 2.1: A *dun-dundundun-dun-dun* pattern



Example 2.2: A trumpet fanfare

Success. Enemies vanquished, with a loss of only a heart-and-a-half this time. But the music marches on inexorably as long as the boy occupies the field of battle—this is still a dangerous place, perhaps. You move the boy, your avatar in this world, along the map of Hyrule Field to find a place to regain hearts before another potential onslaught. At one point, that *dun-dundundun-dun-dun* ostinato stops abruptly, replaced with something lighter, lilting, and lacking in percussive attacks and sharp articulations: the music of Kakariko Village (example 2.3). Perhaps you, as the boy, meet this musical shift with an affective one, a sigh of relief and the intuition that this music marks a safe haven.



Example 2.3: The opening bars of "Kakariko Village"

You know this because the music of Kakariko Village sounds sweet and gentle. Or because it's sweet*er* and gentl*er* than the music of the open field where you'd fought, died, and restarted. Or you know this because you've been here before and expected that musical shift, anyway. Or because you've played games like this before, in which these kinds of musical shifts signaled similar shifts in interactive affordances. (The non-aggressive townsfolk here afford

friendly interactions, not hostile ones. In fact, they are not programmed to respond to aggression.)[1]

Or maybe you don't really *know*. You just feel that change in mood when the music changes its tune. You're not the only one—comments on YouTube uploads of this music fall along similar descriptive lines as those offered above: "This music is so soothing" (from serenakarin787), "This song is so relaxing" (LeafeontheGrass); "Most calm song ever" (Neon Electrode). Some went further, comparing the track with a Beethoven work (from Lauren Mesquite), another to the funereal bugle call Taps (Gecko 1993), alongside numerous references to the flocks of chickens flitting about the area.[2] This small constellation of meanings revolving around the music for Kakariko Village could fall under the umbrella of the *pastoral*—even the reference to Taps, which is most likely motivated by similarities in its leaping melodic contour, draws on the sense of calmness that goes hand-in-hand with solemnity. These are the things that this music calls to mind for these commenters, irrespective of whether or not they have played the game.

[1] Friendly characters in later games of the *Legend of Zelda* series, most recently *Breath of the Wild* (2017), will respond to fighting actions with audible yelps and self-protective gestures, but do not fight back or change their dialogue in response. (I would argue that their persistent friendliness in the face of such aggression attenuates any perceived *attack* affordances.)

[2] Comments by serenakarin787, Neon Electrode, and Gecko 1993: "Kakariko Village – The Legend of Zelda: A Link to the Past Music Extended," accessed September 24, 2019, https://www.youtube.com/watch?v=DjJzFqsfPpo.
Comments by LeafeontheGrass and Lauren Mesquite: "Kakariko Village – The Legend of Zelda: A Link to the Past," accessed September 24, 2019, https://www.youtube.com/watch?v=fw1O6-LjfeA.

How might we then account for these meanings within the context of interactive play? One common approach is to consider what musical changes communicate to players. I could use this lens on the above example, which focuses on a typical sequence of events in *The Legend of Zelda: A Link to the Past*. The shift between the cue heard in enemy-laden Hyrule Field and the music heard in the relative safety of Kakariko Village is a stable signal that players learn to expect over the course of play. Musical changes along with visual ones communicate to the player that she's entered a new space of play defined by the allowed and afforded interactions in that space. In other words, music lets a player know what's going on, which is information that she can then use to guide their actions.

This paradigm does not much account for how she *feels*, nor does it account for the multiplicity of associations, from chickens to Beethoven, that players can ascribe to music. The music-as-communication models tend to take interactivity as a given function—a player hears "town music" and knows that she has entered a town. In essence, such an approach privileges design, which is not necessarily a bad thing, but is limited in the extent that it can account for the ambiguities of play, the feelings and ultimately meanings around interactions, and how those interactions might reframe the "information" that is communicated by music.

In what follows, I take one step backwards from that approach, or perhaps one step inwards. Here, I am interested less in such a "functional" reading of video game music and more in the subtler ways music courts a player's thoughts and feelings, and ultimately their actions. How does music channel these affective energies? This is a question less concerned with *signal*

and more with that potential *sigh* of relief, how it feels to move from the groove of a *dun-dundundun-dun-dun* ostinato to the lilting comforts of the village music.

This chapter provides an account of video game play through music's affective frameworks, outlining the interactive potentials colored by music. I use affect as a lens for analyzing the role of music in contextualizing a player's actions in the world, and ultimately the meaning she draws from it. I argue that music informs interactivity by evoking responses that prime the player for certain kinds of interactions. Through this primed interactivity, the player then forms a perceptual understanding of an environment and its affordances, a process of engagement that maps musical responses onto visual/graphical aesthetics, gameworld events, and other meanings in game space. In turn, such engagement builds meaningful associations in the music, which then informs the player's further interactions. This process of interactivity and understanding in games reflects a dual agency between players and designers; the energy of affect itself is co-creative, in which player subjectivity collides with a prefabricated virtual reality.

The musical frameworks for affect in game environments form what I call *affective zones*, or spaces in games defined by boundaries created by musical sounds rather than by walls, levels, or screens. As musically mediated potential, affective zones can enhance or attenuate interactive affordances in game environments. As outlined in chapter 1, I use the terms *affordance* and *environment* to allow for some meaningful resonance with ecological perspectives that take interaction as a form of meaning-making. In this chapter, I expand on approaches to meaning in

video games by setting out a "bottom-up" account that repositions music from the "background" of games to the ground from which possibilities for play and meaning emerge.

In what follows, I will trace the process through which music outlines affective zones through examples from two Nintendo games, both with music by Koji Kondo: the "platformer" *Super Mario World* (1990) and the "action-adventure" game cited in the chapter's introduction, *The Legend of Zelda: A Link to the Past* (henceforth "*Link to the Past*"). While these examples are intended to be demonstrative, there are many other genres of games that could bolster this perspective on affect and interactivity. My goal here is not to provide a comprehensive account of all kinds of musical affects of play, but to lay the groundwork for further inquiry in this arena.

What about play, and particularly music, creates affective potentials? It relies somewhat on the difficult task of pinning down an idea of what affect is, let alone where we might locate it in musically mediated gameplay. The concept of affect offers a bridge between the empirical sciences and the humanities, having a stake in many fields of thought that, in the 1980s and 90s, turned their concern toward the body and subjectivity. The cognitive sciences saw this turn through the rise of theories of embodied cognition, some of which were described in chapter 1. In the humanities, this heightened interest in the body circled around relationships between bodies and experiences, in the preconscious realm of unknowing that conditions action and cognitive processes.[3] In this conception, affect is potential; it exists just under the surface, in in-

[3] See Marie Thompson and Ian D. Biddle, eds., *Sound, Music, Affect: Theorizing Sonic Experience* (New York: Bloomsbury Academic, 2013).

between states, before meaning and interpretation. A shock of recognition, a primal attraction, an uncanny feeling, the mood to go *that* way…all of these kinds of energies emerge from our interactions in the world (or, in virtual worlds). Richard Grusin cites video games as offering a particularly strongly mediated locus of affect, that "work as modes of trans-modal or cross-modal affective and cognitive modulation" in a way that imitates how infants learn the patterns of the real world.[4] This implicates affect in cognitive processes, and therefore meaning-making.

Considered "before meaning" (but a precursor to it), affect would seem to preclude notions of cognition. Gregory Seigworth and Melissa Gregg's account of affect offers some nuance: "In practice…affect and cognition are never fully separable—if for no other reason than that thought is itself a body, embodied. … Affect is integral to a body's perpetual *becoming.*"[5] If affect underlies potential for learning, acting, "becoming," then perhaps we can find it in that space between player and game, as those energies of encounter between our world and another, exploring, bumping up against walls visible and invisible. Knowing that affect theory spans a variety of understandings in several fields, I take a simple but broad definition of affect to refer to those not-yet-labeled energies of potential, whether potential to do, feel, or act.

In an article about affect and musical embodiment. D. Robert DeChaine describes music as "forc[ing] an encounter between mind and body, clearing a liminal space that is

[4] Richard Grusin, *Premediation: Affect and Mediality after 9/11* (London: Palgrave Macmillan, 2010), 95.
[5] Melissa Gregg and Gregory J. Seigworth, eds. *The Affect Theory Reader* (Durham, NC: Duke University Press, 2009), 3–4.

simultaneously charged with affect and fraught with tension."[6] Music is heard through the ears, perhaps, but also *felt,* and asks the mind to make sense of that feeling. (This is more than a rhetorical dip into Cartesian dualism—indeed, the rejection of the notion that heard sound is the only recourse to music experience is a premise that underlies research on Deaf music culture, for one.)[7] DeChaine cites personal experiences, particularly encounters with live music, in an account of the bodily affects that music can evoke, sensations that underlie what we might think of as the "power" of music.

Discussions of affect in musical encounters nearly always end up as discussions of emotion. Or, put less simply: emotion as our apprehensions of affective responses with regard to contextual information in a self-appraisal feedback loop. For instance, emotions of *joy* and *fear* usually correspond with similar physiological responses. Quickening heart rate, dilating pupils, and hair standing-on-end are three examples of arousal responses that can be apprehended in varying ways based on environmental context. These responses, before such apprehension, comprise an idea of "affect" from at least a neurobiological perspective. What tends to interest those in the analytical practice of music is less the vague physiological reactions and more the way that composers, listeners, and performers can interpret emotional expression through

[6] D. Robert DeChaine, "Affect and Embodied Understanding in Musical Experience," *Text and Performance Quarterly* 22, no. 2 (April 2002), 81.
[7] See, for example, Anabel Maler, "Songs for Hands: Analyzing Interactions of Sign Language and Music," *Music Theory Online* 19, no. 1 (March 2013), http://mtosmt.org/issues/mto.13.19.1/mto.13.19.1.maler.html.

music.[8] Because video games feature a good deal of complicating stimuli beyond music, an analysis of musical emotive expression alone cannot account for a player's affective responses.

Affect in Play

Affect theory has just recently taken hold in game studies, with an eye toward some of the sociopolitical ramifications that mass-consumed video games can have. Aubrey Anable's approach in *Playing with Feelings* (2018) is to consider the bodily relationships that players have with the technologies of video games, especially as shared "rhythms" of energy across different media.[9] She posits these relationships as possibilities for a kind of *rehearsal* of otherwise "real-life" thoughts and feelings. In this way, gameplay can offer new discursive avenues for understanding and expressing modern life: "Video games—as media objects, as cultural practices, and as structures of feeling—can tell us quite a bit about the collective desires, fears, and rhythms of everyday life in our precarious, networked, and procedurally generated world."[10] Indeed, part of the argument of this dissertation is that music can shape gameplay through its own permeation within and without the magic circle, allowing players to bring a musical subjectivity to their play.

[8] A discussion of these topics can be found in Lawrence Zbikowski's "Music, Emotion, Analysis," *Music Analysis* 29, no. 1–3 (March 2010): 37–60. Here, Zbikowski analyzes emotion in music as emerging from the temporal unfolding of musical materials that map in some way to emotional changes or progression.
[9] Aubrey Anable, *Playing with Feelings: Video Games and Affect* (Minneapolis: University of Minnesota Press, 2018), xviii–xix.
[10] Anable, *Playing with Feelings,* 132.

Patrick Jagoda and Peter McDonald home in on interactivity itself to consider how game mechanics shape the affective point of encounter. Mechanics, described in chapter 1 as the essential play activities of a game, are for Jagoda and McDonald "a key point of mediation between the player and the game that opens up the ambiguity of play."[11] In other words, mechanics encompass boundaries with which the player can quite literally play. A variety of affects can emerge in that space of ambiguity, within the frameworks set by the interactive mechanics of the game. Jagoda and McDonald use the example of Mario's ability to fly in *Super Mario World* as a particularly pleasurable interaction given the mechanics of the game, which contain hierarchical structures of frequency and difficulty: flying is infrequently needed relative to the more common actions of running and jumping, and it involves an extra layer of difficulty given its compound nature (involving a combination of running *and* jumping). In other words, constraints around interactions offer channels of affective potential around those interactions. Flight in other gaming contexts might be rather banal, but subsets of flight-related actions could bestow similar affective possibilities: a game like *Star Fox* involves automatic flight in spacecraft, but mechanics of maneuver, including actions like *rocket boost* or *barrel-roll,* can offer a similar source of weightless pleasure (or nervous adrenaline when these actions are done evasively!).[12] Mechanics offer rules, boundaries, and hierarchies governing interactions, creating affective potentials from discovering, adhering to, or breaking those rules through interaction. Play

[11] Jagoda and McDonald, "Game Mechanics, Experience Design, and Affective Play," 176.
[12] But contrast this game with additional options in its follow-up title *Star Fox 64*, with some rather frustrating ground- and water-craft. The player's return to the air might seem rather freeing after all, even if aircraft is the default vehicle.

involves learning a system and its rules through interactions that might be predictable or probable, but ultimately indeterminate—hence the ambiguity of play that makes analysis a difficult task. Examining the possibilities of such ambiguity offers an avenue for analysis that embraces the messy nature of play, and exploring the affective energies around *potential* thoughts, feelings, and (inter)actions necessarily implicates music.

Players and designers alike certainly acknowledge that music provides a kind of affective element to game experiences, which is often framed as more complex evaluative phenomena such as mood, feeling, or emotion. (Recall, for example, the YouTube comments cited above that describe the "calm" and "soothing" music for Kakariko Village.) In her guide to video game music composition, Winifred Phillips notes that "our goal as composers will be to create music that matches the emotion of the visual aesthetic, so that the player will be able to perceive the beauty and detail of the graphics and animations."[13] This audiovisual matching paradigm, one that prioritizes a coherent *Gesamtkunstwerk* of sorts, frames the kinds of feelings that music can evoke in the player as being baked into the overall design. It resonates as a cinematic approach: for instance, the death of a beloved character might be accompanied by music that is slow, contemplative, and dominated by descending melodic lines, the sadness of the scene matched by the perceived "sadness" of the music (one that nonetheless relies on a mild listening competency in tropes of Western music). But where might we locate the sadness of a scene that is interactive, partially constructed by the whims of a player? Imagine a player experiencing this sad scene and

[13] Winifred Phillips, *A Composer's Guide to Game Music* (Cambridge, MA: MIT Press, 2014), 46.

immediately restarting the game from an earlier point to see if he could avoid the character's death. Upon replaying again and again, however, it becomes clear that this scene is indeed "hard-coded" into the game; no matter what he does, he cannot avoid this point in the plot. Consequently, each reappearance of this scene might correspond with feelings of frustration, even anger as much as sadness, as player agency has been denied. These kinds of responses, related as much to denial of agency as to a player's relationship to the ongoing plot, could then spur on further kinds of interactions. (A popular line of interactive inquiry: *what if there's a secret or a glitch in the game to get this character back?*)[14]

A definition of "affect" differs from emotions and feelings in that it is less about the evaluative, determined character of the "sad" music and rather about the kinds of potentials for action and meaning that such music can offer in combination with virtual environments. That is, affective zones do not provide reactive responses, but comprise affordances for actions and understanding that may take a variety of paths depending on the player's subjective experience. Imagining a co-creative aspect of games means imagining how those moods and emotions that are seemingly "designed" into a game and its music might manifest in the player and his interactions.

[14] For example, many players plumb the depths of *Final Fantasy VI* and *Final Fantasy VII* in attempts to revive the characters General Leo and Aeris, respectively. Spoiler alert—they stay dead, but their narrative deaths do not preclude their reappearance through hacking or "modding," nor does this limit the amount of speculation and false rumors many years after the game's release. For example, see discussion about General Leo on this *GameFAQs* message board: https://www.gamefaqs.com/boards/554041-final-fantasy-iii/45404001.

My analysis of music in this chapter considers both affordances for interactions as well as the responses that such interactions can incur. This does not preclude emotional responses; of course, music in video games can certainly feel "happy" or "sad" for whatever reason. Consider the player described above, angry at his inability to avoid a character's death. The sad music is probably felt and understood as "sad," but still contains the affective residues of that frustration in his lack of agency, a feeling that motivated a host of actions not prescribed by the design of the scene or its music. I focus here on the ways in which music creates affectual contexts for interaction that *in turn* create contexts for further appraisal of music, whether those are emotional meanings, narrative associations, event-based understandings, or any other variety of meanings within video game environments. I'll discuss first the ways that affect generally operates within these contexts.

As I characterize it, the affects of gameplay circulate in the interactive encounters between player and game. Broadly, affect can be implicated when: players press a button to perform an action; that action does something, or nothing; something in the environment changes regardless of buttons; players feel more or less "engaged" in what they are doing. The latter element of this definition of encounter raises several questions regarding the degree to which we need to be "playing" at all to be implicated in an affective experience. If my brother is watching me play *Donkey Kong 64* as a passive spectator, is he affected by merely observing my travails through a 64-bit jungle? What about my mother, in a room nearby not watching but still *hearing* the music and sounds that accompany my playing? If either of them didn't know the game at all, how does

that musical encounter change? I would indeed argue that musically mediated affectivity is probable, not merely possible, in any of these contexts. (For one, repetitive "overhearing" of music might still enter our consciousness and fuse to memory, an important component of meaning-making.) Nonetheless, I return to my focus on interaction and environments to describe how music shapes the virtual space of play.

Musical Frameworks for Affective Zones

In keeping a focus on players, the notion of affective zones offers an avenue toward a more tenable theory that grounds affective potential in game environments as spaces of interaction. Affective zones within and around these spaces frame and prime our perceptions of those potentials. The reason that I focus on *music* as the primary feature that marks out these zones (besides the very practical fact of my area of expertise) is twofold: (1) its particular affective capabilities that come through its iteration through time; and (2) its ubiquity in video games as opposed other kinds of games, such as sports or board games. As discussed in chapter 1, music perception engages somatic (embodied) responses as well as higher-order processes of memory, offering frameworks for entrainment and expectation that function similarly to the constraints of mechanics that govern play. Combined with the video game environments the music is meant to accompany, these frameworks form *affective zones*, the "areas" within environments in which music incites different potentials for action and appraisal. In this way, I use the term "zone" differently from Axel Stockburger's sound object category of "Zone": Stockburger comes closer

to my definition of location-triggered musical cues, or sounds that are "connected to a location" in a game as a functional, design-oriented classification.[15]

Some of the ways in which we might think of music as offering affective potentials in relation to action relate to a kind of self-modulation of mood, in what Tia DeNora calls "affective agency."[16] For example, the digital era now allows easy access to music on-the-go, customizable playlists as portable soundtracks for all kinds of "real life" interactions—commuting, writing, exercising, and so on. We might, for instance, put on up-tempo music for a workout warm-up, and calm, slower music for a cool-down. Through our own programming of such soundtracks for action, we create affectively congruent sonic environments, either to encourage ourselves to follow suit with the task at hand, or as a means of distraction from its pains and banalities. The point is: music as a channel for modulating environmental affect is not restricted to fantastical worlds.

But in those fantastical worlds of video games, players have much less personal control over creating a "congruent" playlist for what they might want to do or feel.[17] Video game music is designed to sound a certain way, to trigger at certain moments, and to, as Winifred Phillips states, provide a kind of "emotion" that is congruent (that "matches" or maps onto) to the

[15] Axel Stockburger, "The Game Environment from an Auditive Perspective," (paper presented at Level Up, Digital Games Research Conference in Utrecht, NL, 2003), 6.
[16] See Tia DeNora, *Music in Everyday Life* (Cambridge: Cambridge University Press, 2000).
[17] It should be noted that many games make personalized soundtracks possible, particularly in games in which an illusion of a cinematic narrative or a fantastical world is not necessary, such as sports games. (This is not to say that sports games do not employ realistic looking "cinematography" to emulate real-life sports games, not to mention the dramatic narratives that playback editing can offer.)

environment and tasks at hand. Where control lies, then, is not in musical choice but in the notion of congruence: running and jumping in a game that has soft, slow music is just as musically incongruent as it would be if you performed those actions during your cool-down playlist at the gym. And because video games offer tightly constrained sets of actions and goals, they provide a useful sandbox for examining affective valences around multimodal congruence, as well as the particular kinds of tensions when some things don't line up.

Congruence in games—that sense of "matching"—is related to what I've so far called the rules and boundaries of music. The computational nature of video games entails that their features are laid out in routines and procedures. Put another way, video games form systems in which music is a subsystem, deployed procedurally and consistently alongside text and graphics. In the last decade or so, developments in gaming technology have led to more adaptability on the part of the system, further concealing from the player those inner computerized workings that games like *Super Mario World* lay a bit more bare. We might conceive of music used in early video games as evidence of hardware limitations, but it also offers a good starting point for thinking about the ways music creates spatialized zones of affective potential. Simply put, there are fewer variables—and starting with early video games will offer a basic theory for expanding on games that *are* more dynamic and responsive to player action. Still, modern games are built from rules that can be learned: even music that adapts to a player's actions will adapt in a specifically programmed way, a way that is perceived over the course of interacting with the game environments.

In this way, the procedural nature of music helps form boundaries of affective zones, but affect requires an encounter between human and machine, which lies in how we perceive the mechanisms of music in relationship to ourselves in play. A piece of music heard in some place within the world of a video game invites the player into that world through embodied perception, semiotic relationships, physiological sensations associated with gameplay, cultural listening competencies, memory and expectations—the list goes on. The music weaves itself within the game's environmental design, through the player's interactions and learning, and through whatever narrative events it is meant to accompany. Here, Michel Chion's "audiovisual contract" is helpful, providing the idea that sound and image are not somehow separate from one another but instead form one perception of *audiovision*.[18] Karen Collins adapts Chion's concept for video games, describing moments of *kinesonic synchresis* when sound, image, and action all align to offer a distinct multimodal meaning.[19] These tangible synch points offer opportunities for contact between player and game: indeed, the sensation of being "drawn in" at these moments is a form of affective experience in itself. While Collins is speaking mostly of synchronous sound effects rather than music, the learned associations between music and gameplay are themselves a kind of synchrony. And while sound effects can be important for affective response, as well as for forming meaning and understanding in video game environments, they do not create the same kind of spatialized atmosphere that music does in its formation of "zones."

[18] Michel Chion, *Audio-Vision: Sound on Screen,* trans. Claudia Gorbman (New York: Columbia University Press, 1994).
[19] Karen Collins, *Playing with Sound: A Theory of Interacting with Sound and Music in Video Games* (Cambridge, MA: MIT Press, 2013).

Even before audio-haptic-visual associations are created, our encounters with the music itself also form potentials for affect, if more fleeting. Take Grant Kirkhope's cue for "Freezeezy Peak" in *Banjo-Kazooie*, which includes a musical quote from "Waltz of the Flowers" from Tchaikovsky's *Nutcracker* ballet. Many of those familiar with the traditions of classical music will immediately recognize the tune and its origins, and with this recognition will come a particular feeling, a kind of spark that situates our musical subjectivity within the game environment. With respect to the environment of *Banjo-Kazooie*, this quotation will form a zone that blends this affective energy into its interactive affordances—Freezeezy Peak just happens to be a Christmas-themed environment. That affective energy, as DeChaine might say, "forces" the appraisal, the "a-ha" of conscious recognition. The decorated tree, wrapped presents, and colorful lights of this area offer such a context for recognition. Still, many players might not explicitly know that the music quotes *The Nutcracker,* let alone "Waltz of the Flowers" (after all, the music is no longer a waltz in triple time!), yet they might still feel a general sense of familiarity, perhaps aided by the environmental Christmas cues. This also works in the reverse: the "Christmas" decorations in the *music* help create an affective context for understanding Freezeezy Peak's world. Music's affect lies in these sensory reactions to music, whether rhythmic "feeling," gestural analogy, or a subconscious recognition that compels us into a state of familiarity.

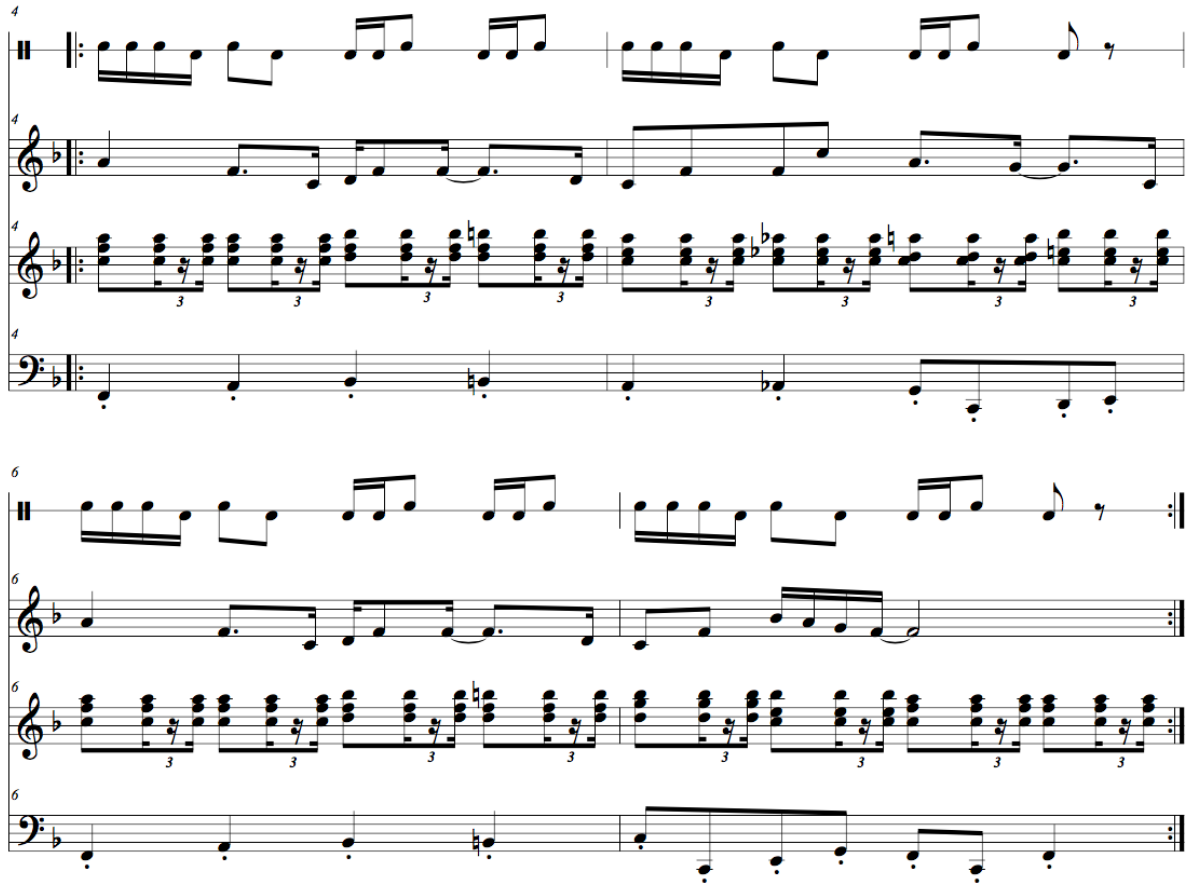
Time Running Out in *Super Mario World*

I will now turn to one of the major musical cues in *Super Mario World,* which provides a clear example of affective zones, interaction, and meaning. The primary level theme, a location-

triggered cue titled "Overworld," can be heard over the course of several outdoor-based platform stages—among which, at several points, actions of running, jumping, and flying are required or encouraged. The track is lively and upbeat, with a colorful assemblage of instrumentation exploiting the timbral capacities of the audio chip on the Super Nintendo Entertainment System (graduating from the 8-bit sound waves from its predecessor to synthetic instruments with many more sonic possibilities). It's a bit of a smorgasbord of musical flavors: a combination of steel drums and ukulele points toward *calypso*, but the bass instruments (tuba and string bass) don't really fall into that category. (Indeed, had the steel drums not carried the melody exclusively, we might be inclined to hear the ukulele as a banjo, given its connection with the tuba in Dixieland music).[20] Regardless of stylistic ambiguity, the pitched layers in combination allows us to easily apprehend this as "tonal music in the key of F"—a musical rule of sorts. Internal repetition of the periodic theme (example 2.4) affirms the F-major key center, an interpretation further solidified with every loop of the track as a whole. The variety of rhythmic layers iterate time down to the 16th-note-triplet, forming a consistent metrical framework to which one might easily entrain—another musical rule. Indeed, each repetition increases the player's familiarity with the music,

[20] In discussing composing for the Super NES/Famicom (and for *Super Mario World* in particular) Koji Kondo describes how he consciously aimed for unusual combinations of instruments: "It was a huge shift in sound from what we had been doing on the Famicom. The FDS [Famicom] really only added that one extra channel. The SFC [Super Famicom], on the other hand, was a decisive split from the game music of the past. It truly was a new sound. I spent a lot of time then thinking about what direction game music should go from here. The cheap square wave sound of the Famicom had come to define 'game music' for most people, but the SFC could play a much wider variety of tones and sounds. That being the case, should I try and imitate 'regular' music that we hear all around us? Or should I try and use these sounds to create a new style and lexicon of game music? I had to really pause and think here." From an interview with Koji Kondo in *Game Maestro Vol. 3* (published in Japan and translated by Shmuplations [pseud.], 2001), accessed September 24, 2019, http://shmuplations.com/kojikondo/.

both through a confirmation of expectations in time as well as the more static sensations of metrical frame and tonal center.



Example 2.4: "Overworld," mm. 4–7 (*Super Mario World*) (From top to bottom: bongos, steel drum, ukulele/banjo, tuba)

An immediate response to this music could be described in terms of potential physiological arousal, primarily incurred by the multilayered rhythmic energy of the track. Once the player chooses a level, a one-bar introduction plays—a simple incipit whose syncopation

doesn't offer much information about tempo or meter, while a black screen that says *Mario Start!* appears (figure 2.1). (This concealment of meter along with a black screen could prime such physiological arousal even more so, with its anticipatory nature.) Then, the player sees her avatar, Mario, in the environment at hand, the music beginning as well: the constant strum ukulele, the straight, beat-rushing syncopations in the steel drums, persistent bass, the dancing tempo, its breathless and breakless looping. It is an effervescent track, enveloping the player in rhythmic energy.

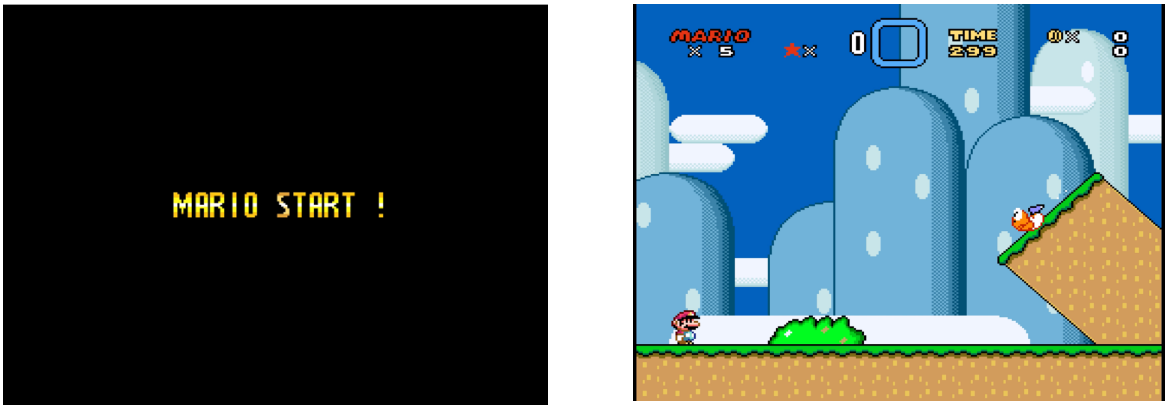
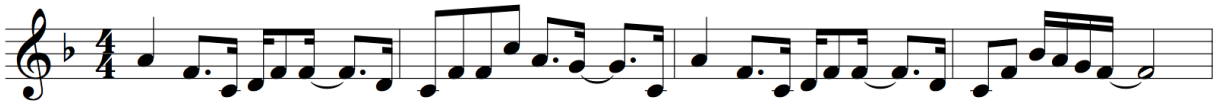


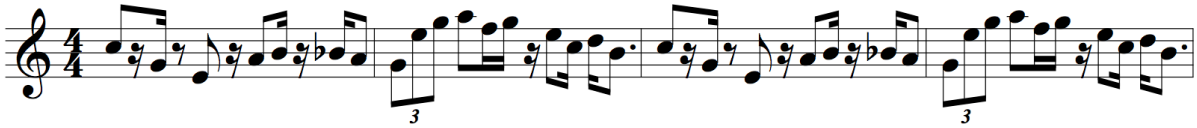
Figure 2.1: Start screen and opening to Yoshi's Island level (*Super Mario World*)

Alongside these energetics, experienced players in this genre of games might feel that affective tinge of familiarity through a connection with a classic; in many ways, this music sounds similar to the original level theme in the first *Super Mario Bros.* (1985), also composed by Koji Kondo. Similarities between the two are evident in the contour and syncopation of the opening of each melody, shown in Examples 2.5 and 2.6. The eclectic indexing of jazz and Latin genres

evident in both cues, each with an arpeggiated melody syncopated over a bass groove, is a kind of schematic musical "rule" learned by players familiar with the genre, and thus might prime players of *Super Mario World* to expect to perform athletic feats of running, jumping, and block-breaking.



Example 2.5: "Overworld" melody (*Super Mario World,* 1990)

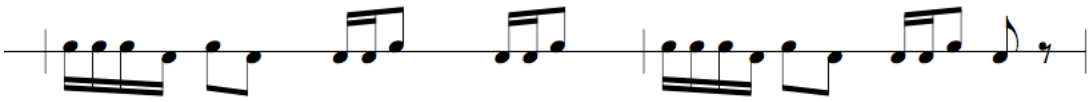


Example 2.6: "Overworld" melody (*Super Mario Bros.,* 1985)

As players play along in the groove of this musical cue, they might find the dinosaur-like, rideable companion called "Yoshi" (figure 2.2). When Mario hops on Yoshi, bongo drums enter the music as another rhythmic layer (example 2.7), present until Mario hops (or falls) off his companion. Yoshi's bongos, emerging in synchrony with player interaction, form a *kinesonic* mapping between music and environment, one that acknowledges Yoshi's abilities as augmentative of Mario's abilities: Yoshi can hurt enemies more easily, or springboard Mario to jump extra high. The bongos are also a musical augmentation, adding another musical layer to an

already lively track; the music beneath does not alter its form or instrumentation to accommodate the bongos. In this example, a musical entrance signifies Yoshi's entrance, and the player's understanding of Yoshi is channeled through the bongos' relationship with the rest of the music: a bit of an added bonus, but not totally necessary.

Figure 2.2: Mario atop Yoshi (*Super Mario World*)

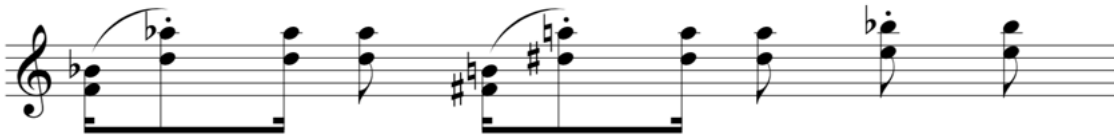


Example 2.7: Yoshi's bongos in "Overworld" (*Super Mario World*)

The player interacts with the level, getting to know its contours, pitfalls, secrets, and treasures. At this point, music is activating the space between player and game, creating an encompassing zone of musical affect that constantly "plays with" the environment at hand along with the player. The Overworld cue is a musical framework whose rhythmic energy primes the player for a highly active zone of interaction in which Mario runs, jumps, flies, and spins his way toward an end goal. In the zone of this interactive potential, the music colors those feelings of

play and becomes a meaningful point of reference. Those arpeggiated leaps become metaphors of real leaps, the colorful ♭$\hat{3}$s and ♯$\hat{4}$s of standard jazz style link now to perilous platform maneuvers that subdivide game space. The sheer repetitiveness of the track is also a relentlessness, a confirmation that time is still going, and that you haven't died yet. (The death of Mario stops the music with its own unique cadential musical tag.) Actions antithetical to that musical energy (stopping, moving slowly or backwards, etc.), form affective potentials around subversion, irony and failure, as they play "incongruently" with the music, or: they're against the rules. In other words, this music affords quickness and variety of action.

At the same time, the music opens a channel for reshaping interactions through breaking the rules. *Super Mario World* exploits the affective potentials of musical change to call the player's attention directly to action. The Overworld cue is a static loop until the player's countdown timer, subtly located amongst other information at the top of the screen, falls to "100" (this countdown, in units quicker than 1 second, usually starts in the 300–400 range). At this moment, a short musical cue (example 2.8) triggers a dissonant, tritonal and chromatically ascending 'fanfare' that functions as an alarm, not least because it is out of sync with the music. *Time is running out!* This fanfare heralds a noticeable tempo uptick in the Overworld cue, as if to also indicate that the *music* is running out, too.



Example 2.8: "Hurry!" alarm (*Super Mario World*)

This is an affectively charged moment in play. The fanfare is disruptive, not only in its musically unprepared entrance but also in its dissonance with the harmonic and rhythmic expectation frameworks established by the Overworld cue. This "shocks" the player's attention, whether she knows what this alarm means or not: *something has happened.* The transition to "faster" music then makes available the parameter of *tempo* as a meaningful musical rule: the player now understands that her interactions in the environment have been "too slow" and that she needs to progress faster toward the goal. This faster version of the same music forms a new affective zone within the same environment, a zone that reflects a new relationship between action and musical tempo. Tempo forms the zone for different affective potentials in this space, a framework with which the player's prior interactivity, perhaps more winding and exploratory, now comes into conflict.[21] Furthermore, the player's perception of environmental affordances

[21] The most extreme version of this phenomenon occurs when the player has repeated a level many times, perhaps completing much of the level successfully but finding difficulty towards the end. In this case, repetition of successful actions inscribes a form of repeatability to those actions that becomes tied to parts of the music. If a player interacts in the same ways, she might reach a certain obstacle, for instance, at the same time in the loop of the music. If this is a moving obstacle, she can time her actions in accordance with the music. (This is essentially how blindfolded "speedrunners" play.) In this mode, music's motion through time becomes available for timing actions precisely in a way that is not designed but rather an emergent feature of play. (This linear aspect of music in play is explored further in chapter 3.)

might change to reflect the new rules for play—for example, in moving faster toward the goal, she no longer perceives coins and other optional treasures as ripe for picking.

Zones of musical affect invite the player's senses and subjectivity into the space of interaction, effecting an extension of cognition in learning the boundaries of rules in these fantastical environments. Over the course of interactions, learning the level's topology, its affordances, and its various paths toward success or failure, features of music become inevitably mapped onto other features in the process of making meaning in an environment structured by these audio-visual-haptic combinations. Along those lines, we could say that the Overworld cue's stylistic mélange might map meaningfully onto the sheer topological variety of levels in *Super Mario World,* whose textures gain a gastronomic valence with food-based place names such as Cheese Bridge, Donut Plains, and Chocolate Island. (See figure 2.3 for a map of *Super Mario World.*)

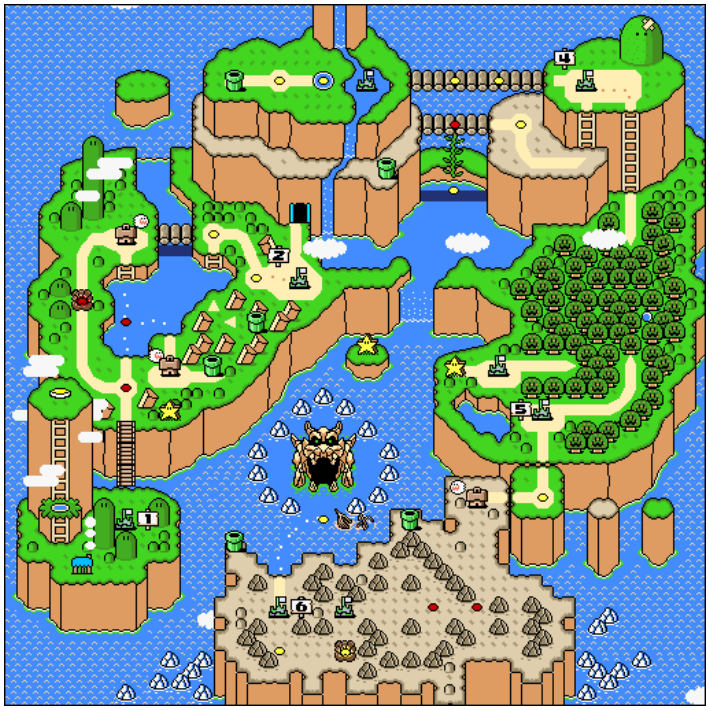


Figure 2.3: A overview map of *Super Mario World.* Each red and yellow dot indicates a level that players can enter.
(source: snesmaps.com)

This variety is explored and understood through interactions that progressively open up the levels to the player's access. The timbrally rich sonic textures of the Overworld cue map metaphorically onto topological textures in the environment, reinforcing but also expanding the meaning of *texture* through cross-modality. Elements from the music relate to elements of the environment not through mere Pavlovian association, but by interacting within the environment in its playful unfolding. Each time the Overworld cue is used in a level, the players' interactions through that level—through the music—offer a process of building more meanings, strengthening some and attenuating others. Those beachy calypso instruments could associate

with the outdoor setting of the levels—sunny weather, green grass, and swimming in the "Yoshi's Island" part of the world, where one first encounters this cue. But as the player experiences this same music over the course of many different levels, it becomes laden with more game-specific meanings: movement through space, jumping through the air, finding hidden passageways, the super powers of mushrooms. In other words, music is constitutive of an experience of a game, while the game, in many ways, constitutes the experience of that music.

Zones of Safety and Danger in *The Legend of Zelda: A Link to the Past*

Returning to the opening example from *The Legend of Zelda: A Link to the Past* will provide an illustrative comparison to the Overworld cue in *Super Mario World,* which was largely analyzed in isolation with the environment of play in which it was encountered. That analysis reflects the nature of encounter: the player chooses the level from a selection screen, and the level appears along with its music. Once the player reaches the end of the level—whether through navigating to the goal, being hurt by an enemy, or falling into a pit, and so on—the music stops and changes as the player is returned to the selection screen.

Link to the Past, on the other hand, is an "open-world" game, within which there are no "levels" to be chosen from a map-like menu interface. Unlike *Super Mario World,* the narratively driven *Link to the Past* offers an assortment of environments that afford different interactions, with an accompanying variety of music. While not a platformer game, *Link to the Past*'s mechanics are nonetheless based on overcoming challenges of getting beyond obstacles and enemies; because of the environmental variety of its "open world," however, such challenges are

discovered by way of exploration across a map with its own embedded challenges. In open-world games, the boundaries between environments are not always clearly defined visually, but music informs these boundaries through affective zoning.

Shigeru Miyamoto, creator and producer of the *Legend of Zelda* games (as well as the *Super Mario* games), envisioned the series partially as an homage to the then-popular *Indiana Jones* film series along with the medieval fantasy themes that dominated current role-playing games.[22] In describing his inspiration in an early interview about the first game of the series, Miyamoto remarked:

> An everyday boy gets drawn into a series of incredible events and grows to become a hero. Within that framework, I wanted to create a game where the player could experience the feeling of exploration as he travels about the world, becoming familiar with the history of the land and the natural world he inhabits.[23]

Accordingly, the original *Legend of Zelda,* released in 1986, sets the core narrative that each *Zelda* installment revisits and expands upon. You play as a boy (Link), who is tasked with saving the Princess (Zelda) and the world (Hyrule) from an evil force (Ganon). These three figures are reincarnated in each main series game, with some variations. (Zelda, for instance, develops a bit more ludic agency in later games.) Link's quest takes him throughout Hyrule and its different geographical topologies, imitating the variation of the "real world"—some areas are

[22] Shigeru Miyamoto, Takeshi Tezuka, and Koji Kondo, "The Legend of Zelda Developer Interview," interview by Akinori Sao, date unknown, accessed September 24, 2019. https://www.nintendo.com/nes-classic/the-legend-of-zelda-developer-interview.
[23] "The Legend of Zelda: Sound and Drama" audio CD liner notes (1994), accessed September 24, 2019. Translated by Shmuplations [pseud.]. http://shmuplations.com/zelda/.

cold, some are warm, some are mountainous, others flat, with a handful of towns (and later, different ethnic races who inhabit these varied lands). Woven into geographical exploration are the mechanics of combat—Link encounters a variety of enemies under the spell of Ganon who inhabit dangerous parts of the world. These enemies, if not avoided or defeated, might hurt Link through contact, taking away his accumulation of *hearts*, or his tally of health, as in this chapter's opening vignette. Typically, villages, shrines, and other populated outposts (e.g. Kakariko Village) comprise safe havens. Figure 2.4 shows a representative map of the world of Hyrule, printed by Nintendo for game players.

Overall, the narrative and world of *A Link to the Past* imitates an archetypal "legendary hero" story, vaguely Arthurian in its design. While *Super Mario World* ostensibly also required one to engage in some princess/world-saving, its individual levels were whimsical and metaphorical, with no obvious connections between such a chivalrous overarching goal and bopping Goombas on the head. On the other hand, every action in *The Legend of Zelda* relates explicitly to the world and its story.

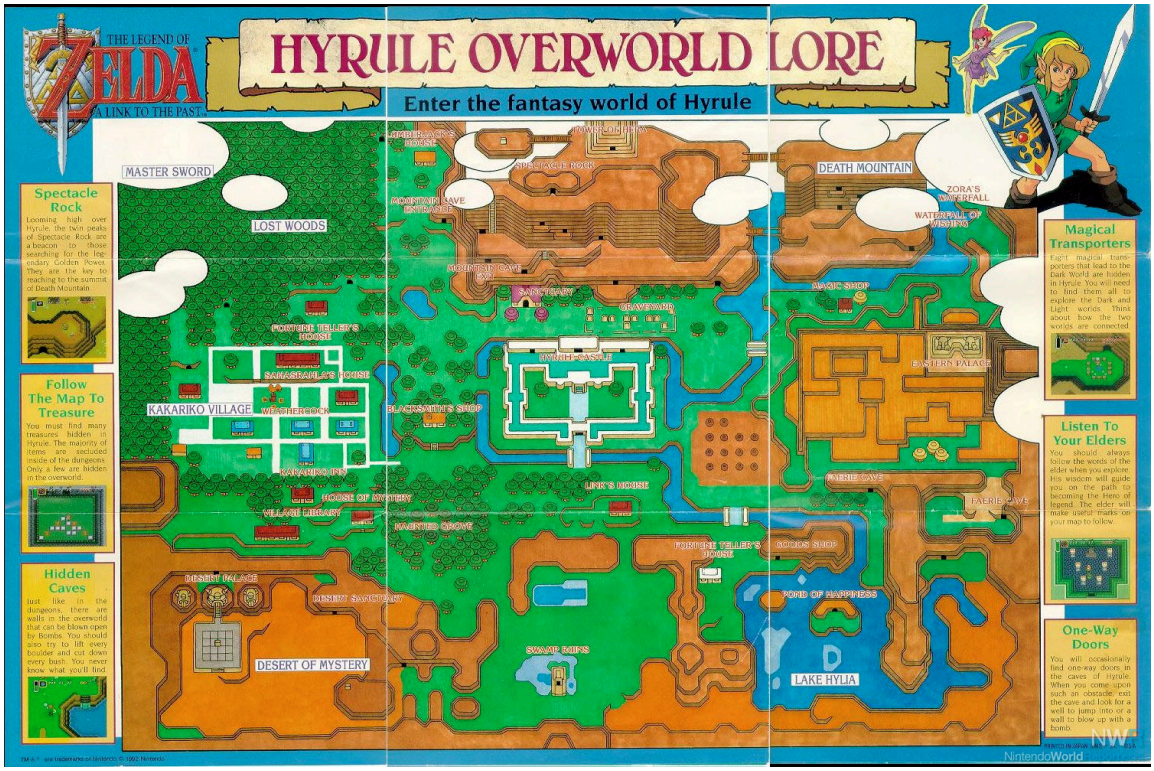


Figure 2.4: A map of Hyrule in *Link to the Past,* bundled with the North American SNES cartridge.
(source: nintendoworldreport.com)

Because a player's interactions are embedded in an ongoing plot, many of the affective qualities of music, not just in *Link to the Past* but all of the *Zelda* series games, relate not only to environmental affordances but also to broader reflections of world and narrative design. Music in *Link to the Past* embraces the series' gestures toward medievalist fantasy, drawing from literary tropes that predate video games by centuries. (In touching on the literary, this analysis will incidentally function as a bridge to the next chapter, in which I bring narrativity to the fore in analysis.)

Figures 2.5 and 2.6 show a visual comparison between Hyrule Field and Kakariko Village as the player would see them on her screen. On the one hand, the village is marked as different by the appearance of cottages and townspeople, but those are not visible at the entrance. Furthermore, the rules of the game do not stipulate that those features are inherently safe—that is, cottages appear all over the game's world, in places that may indeed be dangerous, or in places whose status as safe havens changes throughout the course of play. In the present case, however, it is the change in music that marks the affective transition between the relatively dangerous Hyrule Field and the safety of Kakariko. The metrical frameworks exhibit this contrast, as already alluded to in examples 2.1 and 2.2. Hyrule Field's music is brisk, march-like in a fast 4/4. Kakariko's music, by contrast, is in a slower, swaying 6/8. There is no musical transition between these two tracks—once the player has left Hyrule Field and entered Kakariko Village, the first track stops and the second track enters, with the shortest bit of silence by way of a break.[24]

[24] The technology of later consoles allowed for rather seamless transitions in music, allowing sound designers to utilize the affective charge of abrupt changes to alert the players to particularly significant changes in environment or storyline narrative.

Figure 2.5: Hyrule Field (*Link to the Past*)

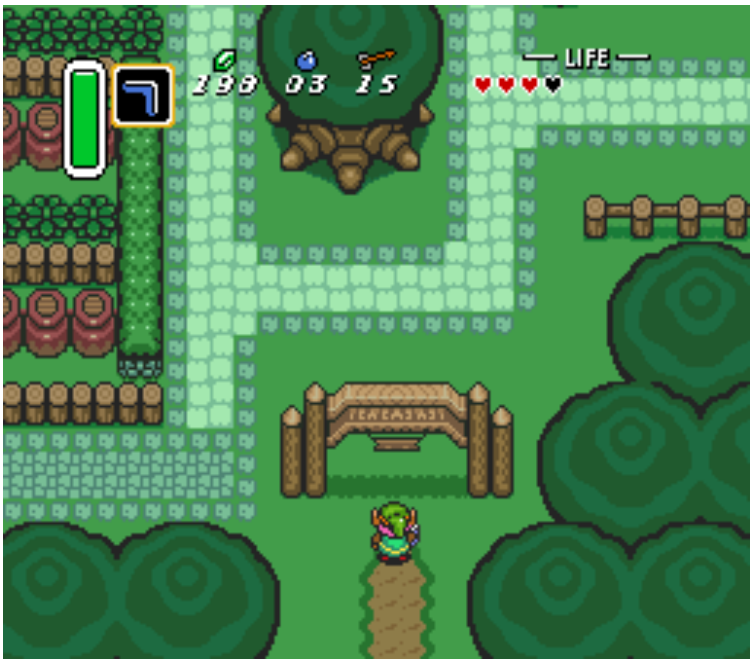
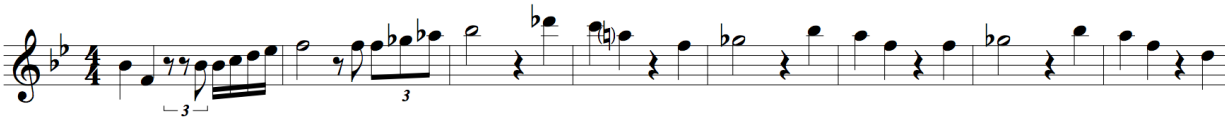


Figure 2.6: Kakariko Village (*Link to the Past*)

As with the *time is running out* cue in *Super Mario World,* the musical change is a point of affective potential. The shift between Hyrule Field and Kakariko features a sudden replacement of musical frameworks in the midst of a relatively continuous topography and player movement. This moment of contact between two zones is also a point of rupture, a break in the flow of play that compels a player's attention to perhaps act accordingly. "Acting accordingly" in this context involves a difference in interactive affordances between the two zones, ones that are primed by the affective character of the music.

Hyrule Field affords all of that sense of adventure that Miyamoto intended. The musical cue for Hyrule Field (henceforth simply "Hyrule Field") is foremost quick, and rhythmically persistent—*this is where Link moves quickly and persistently.* As already mentioned, the rhythms of the snare and low brass, as persistent ostinato undercurrents in triplets and sixteenths, make the temporal framework evident. The rising and falling of the melody in the trumpets, marking downbeats strongly and articulating in staccato and marcato, reinforces this framework. But unlike the clear key of the Overworld cue in *Super Mario World,* "Hyrule Field" vacillates between major and minor modes, outlining what could be labeled as a Mixolydian ♭6 scale (example 2.9). It is a kind of tonal perilousness, or perhaps a bit of garden-variety exoticism—Koji Kondo has cited his influences as Portuguese as well as Japanese jazz fusion, and describes listening to CDs from the "folk music" sections of record shops in order to draw compositional

inspiration.[25] Nonetheless, repetition always returns "Hyrule Field" to a home of B♭, and players come to expect the modally mixed contour of the melody, potentially as an affordance of the dangers of Hyrule Field. This is interaction writ musical—the sharp musical attacks are Link's attacks, the motion is Link's motion, the music exploring harmonic and melodic pitch space much in the same way Link travels across Hyrule.



Example 2.9: Ascending through B♭ major and minor, then emphasizing harmonic minor in the B section of "Hyrule Field" (*Link to the Past*)

Some of the ways in which players apprehend the affective zone of Hyrule Field and its affordances for combat is through the contrast with Kakariko Village, which marks a safe zone with much different interactive affordances. Players find Kakariko Village as a location *in* Hyrule Field, and here, the player is free from enemy attacks. The appearance of cottages and characters affords communication, particularly to gain information and purchase items. Intimately scored for synthesized strings, winds, and a glockenspiel, "Kakariko Village" strikes the ear as operating in a different sound world than Hyrule Field. Tempo and metrical differences are apparent: in a

[25] Kondo describes such influence, subtly pointing to a value of entrainment effects: "I do like those bright, happy Portuguese songs. Sadao Watanabe's music was also an influence, I think. The overworld theme in Mario might show some influence from the Japanese fusion band T-SQUARE, too. The rhythms in their music were easy for Japanese listeners to follow. Sadao Watanabe's Nabesada was like that too." From the *Game Maestro Vol. 3* interview with Koji Kondo. http://shmuplations.com/kojikondo/.

slow but lilting compound meter, there isn't much harmonic ambiguity here—the melody is solidly in major with even phrases in a typical binary form. The rhythm of the melody does play against clear metrical framework of the accompaniment, a 3/4 against a 6/8. This ballad-like track plays off as simple and sweet, its tripping melody registering as perhaps a mode of childish apprehension rather than roguishness amidst the otherwise untroubled arpeggiating (and pianistic) strings. This is the register of the pastoral, a reference to a classical musical topic that, like the militaristic resonances of "Hyrule Field," exploits external signifiers. The frameworks of this music—free of harsh articulations, close to a tonal center, song-like melody—affectively zone Kakariko as not just different from Hyrule Field but also isolated from it. Table 2.1 shows some of the contrast between the two locales.

"Hyrule Field" *Interactive affordances: attack, defend, explore, uncover*	**"Kakariko Village"** *Interactive affordances: rest, regain health, socialize*
4/4	6/8 (or 3/4)
Allegro (quarter note = 130)	Slower, rocking (dotted quarter note = 68)
Brassy and percussive; sharp, separated articulations in the melody	Strings and winds; Smooth, legato melodic articulations
Large ensemble with several different instruments iterating unique melodic or accompanimental content	Small ensemble (melody + accompaniment) with strings and a solo flute or recorder
B♭ major and minor. Emphasis on the augmented second in harmonic minor in the B section	B♭ major throughout. Subtle tonicization of E♭ (IV) in the B section

Table 2.1: Musical contrast reflects environmental contrast between "Hyrule Field" and "Kakariko Village" in *Link to the Past*.

Through musical contrasts in nearly every parameter, "Hyrule Field" and "Kakariko Village" set out sharp boundaries, informing interactive contexts through affective zoning. As the player becomes accustomed to the nature of these different environments and what kinds of interactions lead to progress (and which do not), the music for these environments accumulates game-specific meanings, particularly as related to the narrative tropes of the *Zelda* series. "Hyrule Field" doesn't merely afford "attack," then, but also affords certain understandings, perhaps

Miyamoto's *feeling of adventure,* of chivalry and courage related to broader conceptions of narrative.[26]

As mentioned earlier, interactions that rub up against the affordances of the environment (as partially constructed by musical frameworks of affective zoning) form further opportunities for affective intensities to emerge. Players who have enough experience in games to have a mastery of environmental interactions might experiment in such incongruent forms of play as a form of creating new novelty and meaning when all else has been exhausted. This phenomenon is further investigated in chapter 4 in a discussion of habitational forms of play. For now, I'll return to those YouTube comments about the chickens in Kakariko Village, in order to elucidate some of the rich and subversive possibilities of play that "break" the musical rules in affective zones.

In addition to the signification of music, part of the idyllic pastoral of Kakariko Village comes from its quaint combination of small cottages, cobblestone roads, and a coop of chickens, called *cuccos* in the world of *Zelda*. These cuccos afford interactions—in several games of the franchise, players are tasked with finding cuccos, picking them up, and using their minimal flight

[26] It is worth considering how topic theory might play a role in the long history of troped musical semiotics that seem to appear in both of these tracks. We might consider the literary resonances of the chivalrous hero, hearing the trumpet fanfare as part of a *military* topic while the lulling compound meter relates to the *pastoral.* (See Raymond Monelle's treatment on these topoi in *The Musical Topic: Hunt, Military and Pastoral* [Bloomington: Indiana University Press, 2006.]) While one can argue that any competence in modern tonal music will hear those resonances in these simple tracks, the primary listening audience of this music would have been children encountering such musical connections for the first time in video games. There is nonetheless an important trajectory of influence to trace between actual military practice, ceremonial music, classical art music, all the way to more modern indexicality with the "magical" and "epic" appearing on stage and screen. See Isabella van Elferen, "Fantasy Music: Epic Soundtracks, Magical Instruments, Musical Metaphysics" in *Journal of the Fantastic in the Arts* 24, no. 1 (2013): 5–24.

abilities to jump higher or farther. As interactive objects, cuccos can also be attacked, but do not register damage in any typical way: a few swipes of the sword on the poor cucco elicits a *bok* of a cry, but it does not "die" (i.e., disappear) in the same way that an enemy on Hyrule Field would. Players can experiment with different kinds of interactions that might not be congruent with a zone of pastoral Kakariko Village, including what seems like a particularly vicious attack on innocent cuccos—they cannot harm you.

Or can they? Continuous swinging and stabbing at a cucco, a kind of interaction that plays incongruently with the calm nature of the town, alerts nearby cuccos of such interactive trespass. From all directions, cuccos fly to attack Link, hurting him until he loses all of his hearts or manages to evade in time. The music does not change during the flock's attack, highlighting a kind of irony: its sweetness potentially cloying in the face of your certain death. This is a moment when such incongruent play destabilizes the affective zones of music, playing against the frameworks of music to incite *new* affective potentials with particularly memorable meaning. Not only is attacking a chicken not an afforded action in this space, it is an action that plays against the music, which has established an affective zone of rest and safety.

Further Possibilities of Affective Zones

The examples analyzed from *Super Mario World* and *A Link to the Past* offer just a small comparison of two ways that music can offer spaces of interactive potential—affective zones—in video games. I have not taken into account the full gamut of video game genres in which music

can zone out potential spaces of interaction. For one, we could use tempo as a useful analytical heuristic for racing games, in which speed is the top governing interactive potential. (Consider that many racing games, especially from Nintendo, use *Super Mario World*'s time-running-out zone on the last lap of a race, encouraging last-ditch efforts at maximizing one's winning potential.)

Additionally, both *Super Mario World* and *Link to the Past* are early 1990s games—I've already alluded to the musical differences of these "early" games compared to more recent games that can offer adaptive, dynamic scores that aren't as repetitive and static. One could say that musical "rules" in that case take more time to learn, but they exist. Consider 1998's installment of the *Zelda* franchise, *Ocarina of Time.* Unlike its predecessor, *Ocarina of Time's* musical world does more to react to player's interactions, rather than the reverse. In its version of the Hyrule Field cue, for example, layers of instrumentation and melody fade in and out of the soundscape to reflect whether Link is running (active and percussive), fighting (dissonant and more percussive), or standing still (strings and winds). Nonetheless, we could argue that these adaptations form their own kinds of musical rules, ones that still feed into affects of play. For one, the removal of active melodic layers and percussion when at a stand-still is a kind of musical confirmation of meaning, one that reflects a broader system (in the game as well as beyond) that connects such musical parameters with notions of stillness and relaxation. Beginning to move, then, places a small degree of DeNora's "affective agency" in the player's hands, allowing more

active musical layers to flourish in conjunction with resuming one's goal at hand, and in that shift, offering the affective potentials of action and adventure.

In the case of *Ocarina of Time*'s dynamic soundtrack, we could still argue that the music offers a space for interactive potentials, but that these spaces are shifting, not linked with static spaces in the world as they are in *Link to the Past.* (This formulation is closer, then, to *Super Mario World*'s tempo-delineated zones within the same environment.) This spatial conception becomes even more complicated when we consider multiplayer and networked games, in which affective potentials form *between* players as much as they form within the spaces of player-and-game. In the next chapter, I investigate the linear flow of music in the game *Journey* (2012) which is considered particularly affective in its multiplayer format. In short, the game connects over the internet to an anonymous partner; both players appear as shrouded avatars distinguished only by a scarf that marks the players' respective accumulation of sigils. Players can only communicate to each other through a nondescript *ping*. Typically, players guide each other through the landscapes of the game, which feature musical soundscapes that are composed to be dynamically reactive to the avatar's advancement. In multiplayer, when both players reach the goal together and hear the music swell in response, feelings of connection and intimacy can emerge from that affectively poignant moment. In that case, we might consider the affective zone to encompass the space of that goal, but it is difficult not to also describe such a zone as perhaps crossing continents to create a connection. The possibilities of music and meaning in video games, then, expands beyond the rules and boundaries of procedurality and into the "real" world.

Chapter 3
Playful Stories: Toward a Ludomusical Narrativity of Video Games

After journeying through two chapters, you've arrived at the center of the dissertation.

You look up. "Chapter 3 . . ." Gathering your wits, and perhaps a cup of coffee, you begin to read.

"After journeying through two chapters, you've arrived…"

At this juncture, you have two paths. On the left, you hear echoes from small room, fighting words between the narratologists and the ludologists, arguing over the play-versus-story divide in game studies. To read more about their woes, turn to page 102.

You hear music before you. It wafts from the main hall, toward the chapter's central argument. To skip the ludology vs. narratology debate and jump right into the thick of things, turn to page 109.

Unsure? Turn the page to start at the beginning.

✦ ✦ ✦

Once, Twice, Thrice Upon a Time

Play, in its sometimes aimless pleasures, in the deceptive timelessness of playground hijinks (when teacher's whistle is a shock back to temporally regimented reality), is perhaps most easily understood spatially. After all, most of the video games I've discussed thus far are set within virtual *worlds*, whose ludic challenges dot landscapes both earthly and alien.[1] And as I have outlined, music is often programmed to correspond to distinct locations in the world of a game, circumscribing the musical rules—and, in turn, *affective zones*—of those areas.

Of course, it is the exploration and discovery of those spaces that makes up the stuff of play; the affective zones created by music are as much about what *happens* within those zones as they are about bounding those happenings. Even world-based games are understood through a player's *progress through* that world. Consider one potential exchange between two people who play video games:

> Player 1: "Did you ever play the first *Legend of Zelda* game?"
>
> Player 2: "I started, but I kept dying in one of the dungeons, then got lost somewhere, and never finished."

[1] For example, take the typical description of the levels in the *Super Mario Bros.* series as "worlds" (in both the Japanese original and English translation), imbuing play with an element of virtual tourism that promotes its mechanics of exploration.

In this exchange, the notion of "play" is understood as a beginning-to-end completion of the *Zelda* game.[2] We might compare this conception of narrative to the act of reading and finishing a novel rather than the pacing of the novel's story itself (a classic distinction in narratology of "story" and "discourse"), but as usual, such comparisons fall short in capturing the special aspects of narrative in interactive media like games.[3] Games often contain stories (recall how each *Zelda* title is built upon an archetypal hero-saves-the-world-and-gets-the-girl story), but *playing* through a story is different from *reading* that story. After all, no matter how invested you are in the story of a game, maybe you just *kept dying somewhere,* and were never able to finish.[4]

Regardless of game difficulty, we can still turn to narrative as a potential structure for play. Even if we conceive of play as existing in its own *space* vis-à-vis a "magic circle," formalized *games* typically involve some species of time-bound structuring. Think of any game that is

---

[2] This hypothetical conversation is made all the more possible by a common opinion amongst *Legend of Zelda* players that the first title in the series is very difficult. See the article (and comments on) James Newton, "You're Not Alone in Finding the First Zelda So Hard," *Nintendo Life,* September 8, 2011, http://www.nintendolife.com/news/2011/09/youre_not_alone_in_finding_the_first_zelda_so_hard. Newton cites another article for *Game Informer* in which *Zelda* producer Eiji Aonuma admits that even he hasn't finished the game for its difficulty. (See Phil Kollar, "Zelda Boss Eiji Aonuma Has Never Completed The Original Legend Of Zelda," September 7, 2011, https://www.gameinformer.com/b/news/archive/2011/09/07/zelda-boss-eiji-aonuma-has-never-completed-the-original-legend-of-zelda.aspx.)

[3] The story/discourse rhetorical distinction was largely introduced by literary theorist Gérard Genette, *Narrative Discourse: An Essay on Method* (Ithaca, NY: Cornell University Press, 1980). For a discussion of the comparison between literary narrative and game narrative, see Julianne Grasso, "Music in the Time of Video Games: Spelunking *Final Fantasy IV*," in *Music in the Role-Playing Game: Heroes & Harmonies,* ed. William Gibbons and Steven Reale (New York: Routledge, 2019), 97–116.

[4] One could extend this analogy to consider the concept of "difficulty" in reading texts. It is, of course, possible for the text to challenge us enough such that we "get stuck" and never finish, much like failing to complete a difficult dungeon in a game. But reading difficulty is typically not accounted for in the design of a literary text, where difficulty is a *formal* aspect of video games (not to mention that video games commonly include music, which is certainly a rare feature of books).

oriented by rounds, point-maximums, time limits, and progressive levels—let alone storytelling. Most video games, even while they may offer the spaces for "timeless" play, nevertheless structure that play with some sense of beginnings, middles, and ends.[5]

How could we account for music in these narrative paradigms? Looping, repetitive cues (particularly prevalent in the earlier games I've thus far analyzed) seem to actually promote a sense of timelessness or even spatial orientation—the sense that the music will continue forever, as long as you are here in this space. The goal of this chapter is not to prove that perception to be wrong. Rather, here I will concentrate on the way music (whether looping, linear, or somewhere in between) nonetheless implicates narrative forms. Music brings to bear not just its affective energies but its own formal structuring and rhetoric, and together these intermingle with the structures of games. In describing musically structured play, this chapter will complicate the typical formal conceits of games that have preoccupied game studies: the *ludic* and the *narrative*, often understood in tandem as *ludonarrative*.

I begin with a discussion of what typically defines ludic and the narrative forms in games, and then move on to discuss how music can function among and beyond these forms. I will then analyze two cases that demonstrate paradigms of what I call *ludomusical narrativity*—the ways in

[5] Some of the types of video games that I do not discuss in this dissertation are those without much or any narrative structure. For instance, "sandbox" games like *No Man's Sky* or simulation games like *The Sims* sometimes offer scenarios for winning, but the freedom to roam, design, and explore lends itself to emergent narratives (see reference to Henry Jenkins's work later in this chapter). And of course, slot machines and other kinds of "pay to play" games operate a bit differently. Given the design goal of having players return over and over again (with their wallets), the notion of "end" might never be realized in any way that resembles the kinds of games I discuss in this dissertation.

which music shapes play in conjunction with narrative forms. In *Final Fantasy III,* location-triggered musical cues change to communicate progress in the game. Furthermore, these changes can shape play differently to correspond to narrative changes. In *Journey* (2012), an aesthetically-oriented "art game," music can be understood to structure play while ludic and narrative structures are instantiated relatively weakly. I suggest that difficulties in grappling with *Journey* as a game lie in the unexplored potential of music to be the primary structure of interactive play, and for play to tell an explicitly musical story.

The opening "choose-your-own-adventure" gambit is a bit of a tongue-in-cheek reference to interactive novels that use this strategy; and admittedly, jumping into the concept of narrative might indeed be a task more fit for a brave adventurer accustomed to exploring dungeons and slaying dragons, not dissertations.[6] Theories of narrative cross many fields, often huddling under the guise of "narratology" but also expanding well into music theory. As discussed in the next section, narrative has been a contentious topic in game studies, likely due to disagreements on what narrative means and its significance to play (and, for that matter, disagreements on what "play" means). This chapter will attempt to hold court in a small corner of the expansive universe of capital-N *Narrative*. Because for all of its own entanglements, a consideration of music, narrativity, and play is useful for understanding how music offers potentials for meaning-making in video games.

[6] Perhaps these tasks aren't so dissimilar, given the *snake fight* portion of the defense. See Luke Burns, "FAQ: The 'Snake Fight' Portion of your Thesis Defense," *McSweeney's Internet Tendency,* November 19, 2010. https://www.mcsweeneys.net/articles/faq-the-snake-fight-portion-of-your-thesis-defense. This article is one of the top 50 most-read pieces of satire on that website.

The Play and Story Divide: Ludic "versus" Narrative

When trying to reconcile game structures with narrative structures, some critics find games lacking as a medium for *good storytelling*.[7] If games are about success and failure, points and items, competition and comradery, how can a well-designed narrative with fleshed-out characters fit into these interactive structures? Is storytelling through games even something worth pursuing?[8] After all, plenty of popular, fun games like the classic puzzler *Tetris* or the casual match-3 game *Bejeweled* don't really have stories. Nonetheless, the industry is also chock full of story-oriented games, coming from big-budget "triple-A" companies as well as small indie developers. Game stories have only become more popular in recent years.

In game and media studies the term "narrative" has most commonly referred to the literary sense of storytelling. Video games have been an interest of narratology for decades, posited as an exciting new medium for storytelling. Janet Murray's foundational text, *Hamlet on the Holodeck: The Future of Narrative in Cyberspace,* first published in 1997, finds exciting promise in interactive stories, particularly in the ways that a new medium for storytelling can open more possibilities for one of the claims of storytelling writ large: that it can reveal to us something about human nature.

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[7] For example, see "Video Game Stories (are not really stories)," *Curiouser Institute,* http://www.curiouserinstitute.com/blog/curiouser/video-game-stories-are-not-really-stories; Sterling Guilherme, "Why Video Game Stories Are Bad," March 30, 2019, *Game Savvy,* https://gamesavvy.net/bad-video-game-stories/.

[8] See Ian Bogost, "Video Games are Better Without Stories," *The Atlantic,* April 25, 2017, https://www.theatlantic.com/technology/archive/2017/04/video-games-stories/524148/.

In an update to the text in 2016, Murray doubles down on this potential:

> Storytelling is a constant of human society, allowing us to share meaning across the campfire, the proscenium stage, the printed page, or the glowing screen. As we increase our modes of engagement from listening, reading, and viewing to include navigating, enacting, and interacting, the future of narrative remains the same as it ever was: to deepen human understanding and widen our circles of connectedness. We need stories in every medium we can master, truth and fiction, ephemeral and enduring, unilinear and interactive, secret stories between lovers or family members, mass entertainments shared by millions. We need this creative practice for its own sake, but more than that, we need the process of continuously expanding our means of storytelling, because it allows us to expand our ability to know who we are and to collectively reimagine who we might become.[9]

Although Murray is not speaking exclusively of video games (her coinage, "cyberdrama," is a broader term that includes other forms of computer-based or virtual realities that offer spaces for stories),[10] these remarks reflect a desire to wield media such as video games to new expressive ends.[11] Literary scholar Marie-Laure Ryan's work on narrative across media has similarly reflected this ideal, focusing not only on how narrative is instantiated in interactive media like

[9] Janet Murray, *Hamlet on the Holodeck: The Future of Narrative in Cyberspace* (Cambridge, MA: MIT Press, 1998; New York: The Free Press, 2016), 481. Citations refer to the Free Press edition.
[10] Murray, *Hamlet on the Holodeck*, 447.
[11] In an essay more specifically about games, Murray says as much: "I would argue that we stop trying to assimilate the new artifacts to the old categories of print- or cinema-based story and board- or player-based game. We should instead think of the characteristics of stories and games and how these separable characteristics are being recombined and reinvented within the astonishingly plastic world of cyberspace." See "From Game Story to Cyber Drama," in *First Person: New Media as Story, Performance, and Game*, eds. Pat Harrigan and Noah Wardrip-Fruin (Cambridge, MA, MIT Press, 2003), 10.

video games, but also what these new forms of stories can tell us about storytelling writ large.[12] Indeed, much of the work on games from literary scholars (alongside narrative approaches from game scholars) does not critique the idea of game stories but rather sees potential in a new medium.[13] (In fact, much of the work that *can* be considered critical of the idea of game stories dates from the 1990s and early 2000s, when the range of video games was relatively limited by technology and publishing limitations.)[14]

Those of you who came to this section looking for the "fighting words" between so-called narratologists and ludologists might be disappointed to find that this scholarly war doesn't truly exist. Espen Aarseth explains as much in his definition of "ludology": "Ludology has been erroneously contrasted with narratology (narrative theory), but since the 'ludologists' all used narrative theory in their approaches to games, this juxtaposition is misinformed and does not bear critical examination."[15] So be it.

Nonetheless, it seems that part of the basis for a "ludology versus narratology" debate lies not in scholarly identity or even methodological choice for game analysis. Rather, there seems to

[12] Ryan points to media like film and games, showing how the concept of a story*world* as experienced phenomenologically should be central to narratology, particularly as it pertains to experiences within and beyond the narratives themselves. In other words, "[w]ithout the concept of the world, one cannot speak of narrative as a lived experience." Marie-Laure Ryan, "Story/Worlds/Media: Tuning the Instruments of a Media-Conscious Narratology," in *Storyworlds across Media: Toward a Media-Conscious Narratology,* eds. Marie-Laure Ryan and Jan-Noël Ton (Lincoln: University of Nebraska Press, 2014), 43.
[13] Patrick Jagoda explores some of these possibilities, alongside a discussion of the potential reciprocity of game studies and narrative theory. See "Digital Games and Narrative," in *The Cambridge Companion to Narrative Theory,* ed. Matthew Garrett (Cambridge: Cambridge University Press, 2018).
[14] Espen Aarseth cites several of these opinions, including his own (formerly), in his chapter "Ludology," in *The Routledge Companion to Video Game Studies,* eds. Mark J. P. Wolf and Bernard Perron (New York: Routledge, 2013), 282.
[15] Aarseth, "Ludology," 279.

be a recognized fundamental difference, even incompatibility, between the formal properties of *narrative* and *game,* many of which will be summarized in the following section.[16] Meanwhile, in all of this hullabaloo, music is almost never considered as a formal component (at least by anyone who isn't a music scholar) in games that are not "music games," let alone a potentially confounding feature that could entangle with the ludic and the narrative in meaningful ways.

The Ludonarrative Spectrum

Critics and scholars alike have latched onto the notion that the gameness of games—the "ludic"—and the storyness of stories—the "narrative"—are opposing forces at play in the design of video games. For example, Aarseth considers this ludonarrative spectrum to be enacted along four "ontic" dimensions that all games and all stories contain: (1) world, (2) objects, (3) agents, and (4) events.[17] As summarized in table 3.1, "Ludic" elements in games are all about interactivity—explorable landscapes, usable objects, inhabitable avatars, agency over events, and embedded challenges. On the other side of this spectrum, narrative structures are closer to a non-interactive, cinematic ideal, with pre-designed plot and characters.[18]

[16] For more discussion beyond the scope of this dissertation, see essays in the volume *The Play Versus Story Divide in Game Studies: Critical Essays,* ed. Matthew Wilhelm Kapell (Jefferson, NC: McFarland Books, 2015).
[17] Espen Aarseth, "A Narrative Theory of Games," in Proceedings of the International Conference on the Foundations of Digital Games (New York: ACM Press, 2012), 129–133.
[18] This compelling differentiation has been fruitful beyond games as well. See, for instance, Henriette Heidbrink, "1, 2, 3, 4 Futures—Ludic Forms in Narrative Films," *SubStance* 42, no. 1 (2013): 146–64.

	Ludic Elements	Narrative Elements
world	Explorable landscapes	Linear "corridor" design
objects	Usable, modifiable objects	Non-interactive objects
agents	Empty, inhabitable avatars	Designed, developed characters
events	Agency over events	Pre-designed plot

Table 3.1: A comparative table of some ludic and narrative elements in video games, categorized via Espen Aarseth's ontic dimensions.

Placed on opposite ends of a spectrum, as shown in figure 3.1, these elements can be considered constitutive of the design of a game as a whole, which allows us to place games somewhere along this spectrum according to overarching adherence to more ludic or more narrative elements. For example, *Tetris* and sandbox game *Minecraft* would occupy the extreme ludic end of the spectrum: while these games might offer the potential for emergent narratives, stories that arise are developed by players, not designers.[19] On the narrative end, games like *Dear Esther* and *Gone Home* have been called (somewhat derisively) "walking simulators" because they

[19] The developers of *Minecraft* would release *Minecraft: Story Mode* in 2015, which includes a pre-designed story.

involve a first-person perspective of moving through an area in order to uncover a pre-fabricated story. This story is not itself influenced by the player, and might only minimally incorporate the player's avatar. Other games, with their blend of interactive puzzles and pre-designed story, including the cases described in this chapter (and much of the dissertation, for that matter), pepper the landscape in between.

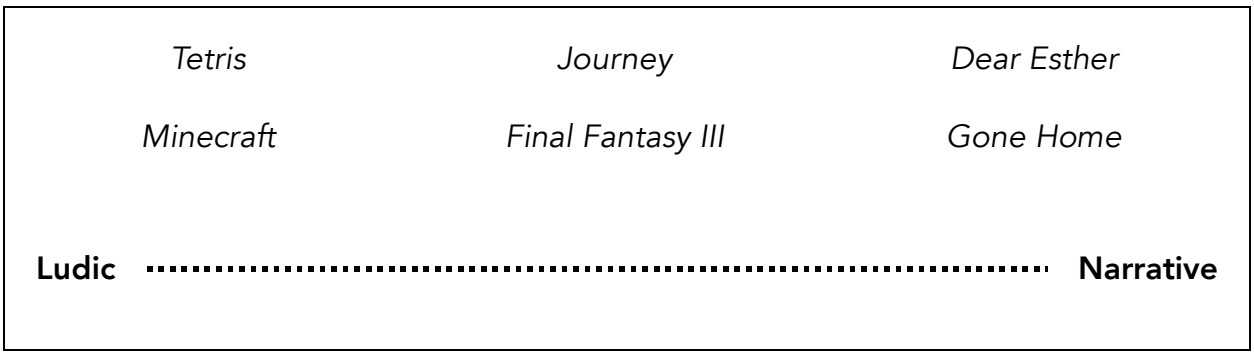

Figure 3.1: A sampling of video games plotted along the ludonarrative axis.

A Note on Ludonarrative Dissonance

Overarching ludic and narrative design is usually privileged in games criticism; we can often see this in effect when games are, indeed, criticized on those terms. Perceived conflicts between the ludic and the narrative elements of a game give rise to a phenomenon is known as "ludonarrative dissonance," a term coined in 2007 by game designer Clint Hocking. Ludonarrative dissonance describes the tension between, on the one hand, what we as game

players are motivated to do by the rules of the game and, on the other, what the story tells us about the characters and world they inhabit.[20]

A simple and common example of ludonarrative dissonance occurs in games in which the player adopts the role of some ostensibly strong, god-like character only to then begin the game wielding the controls poorly (such that this character runs into walls and falls off of buildings). Hocking warns game designers against elements of ludonarrative dissonance, explaining that ludonarrative dissonance negatively affects the player's ability to "connect" with the game: the interactive ludic elements do not make the player feel a part of whatever the narrative conceit is, and therefore the player will probably not enjoy the game in a nice ludonarrative wholeness that Hocking sees the video game medium aspiring to be.

In this critique of ludonarrative dissonance, we see the privilege of these two structuring elements, considered essentially constitutive of play experiences. And, of course, it is easy for me to read games criticism about player experience, engagement, and connection and find music oddly absent. To bring music into the picture where it is missing is not merely a fun heuristic exercise but also, I argue, a legitimate way of investigating how players get into a game, negotiate its ludic and narrative contracts, and come out magically unscathed. In arguing for the notion of a ludo*musical* narrativity, this chapter will contend that music can be considered operative within the conceptual space of the ludonarrative spectrum, but also function beyond it.

[20] Clint Hocking, "Ludonarrative Dissonance in Bioshock," *Click Nothing: Design from a Long Time Ago* (blog), October 7, 2007, https://clicknothing.typepad.com/click_nothing/2007/10/ludonarrative-d.html.

(Ludo)musical Narrativity

Music and narrative are old friends. Storytelling is one of the primary functions of music in cultures throughout the world, and throughout history. Music is a core feature of established narrative multimedia like opera and ballet, and was a part of film even before speech (in the practice of accompanying film projections). An impulse toward narrativity is a structuring principle of much of music theoretical language—one has to think only of the concepts of harmonic *progressions*, motivic *development,* and so on. What marks beginnings and ends? Is this theme a variation on a theme heard before? These are the kinds of questions that narrativize music.

A review of all (or even some) of the ways music and narrative have worked together would be a tiresome exercise for both you and me. But music in the narratives of *games* is where things get stuck, largely due to the issues described in the preceding sections. We've been worried about the capacity for games to portray narrative at all, let alone how *music* could shape these stories.

Nonetheless, there have been a number of formal accounts of music and narrative in video games. These approaches tend to focus on the role of the repeating musical theme, sometimes characterized as *idée fixe* (à la Berlioz), or *leitmotif* (à la Wagner). Themes or motives are analyzed as creating narrative coherence, and providing meaningful resonances with other

musical multimedia.[21] Part of the appeal of investigating musical themes is that it shows that music can solve ludic "problems" through narrativization—music can provide narrative depth to character and place, helping to bring aspects of the story together no matter what the player is doing (or not doing). A thematic analysis also gives us access to richer, more established musical traditions (particularly those of European classical music), thereby effecting a form of legitimization not just of the music, but of video games generally.

In the accounts of music that I take up in this chapter, I also argue that music offers narrativization functions, constraining aspects of play to linear, progress-based understandings. But I don't seek to leave the ludic behind. What I am calling "ludomusical narrativity" refers to the particular ways that music enacts what is understood under the rubrics of "ludic" and "narrative," providing a musically specific formal structuring for play. After all, music is not only understood narratively. As much as we might describe musical progress and time, we also speak of musical space, motion, texture, and distance in key relationships—all of which can map onto games as narrative *spaces*.

In some ways, I am reconciling ludic and narrative by focusing on music. By observing how others have sought to reconcile ludic and narrative forms, described in the next section, we can see how music can help us do the same.

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[21] See, for instance, Jason Yu, "An Examination of Leitmotifs and Their Use to Shape Narrative in UNDERTALE," March 31, 2016, http://jasonyu.me/undertale-part-1/; Jason Brame, "Thematic Unity Across a Video Game Series," *ACT: Zeitschrift für Musik und Performance* 2 (July 2011), http://www.act.uni-bayreuth.de/de/archiv/2011-02/03_Brame_Thematic_Unity/index.html; Ryan Thompson, "Operatic Conventions and Expectations in *Final Fantasy VI*," in *Music in the Role-Playing Game: Heroes & Harmonies,* eds. William Gibbons and Steven Reale (New York: Routledge, 2019), 117–128.

Reconciling the Ludic and the Narrative

Henry Jenkins proposes a taxonomy for narrativity in video games that seeks to also capture ludic elements specific to games.[22] He proposes four ways in which narratives can be mapped onto aspects of play, which I will summarize here.

(1) *Evocative spaces*. These are physical or virtual environments in games that "draw upon our previously existing narrative competencies" to evoke aspects of story circling in our imaginations and memories.[23] One example is the game *American McGee's Alice,* drawn from (but not reenacting) Lewis Carroll's *Alice in Wonderland.* Similarly, games that license intellectual property from film franchises, but do not necessarily retell those stories, can fall into this category. *Star Wars Battlefront* is a shooter that takes place on various planets in the *Star Wars* universe, incorporating familiar characters like Luke Skywalker and Darth Vader without reenacting the stories of the films.

(2) *Enacting stories.* Games that allow player agency in a story's events can be considered to allow for the *enacting* of those events. In the example from chapter 1 in *Final Fantasy IV,* fighting and defeating Golbez is as much a part of the game as it is an enacted element of the narrative. Jenkins relates this concept to improvisatory theatre, which often includes a mix of basic structure and vocabulary with some degree of freedom. Several role-playing games and

[22] Henry Jenkins, "Game Design as Narrative Architecture," in *First Person: New Media as Story, Performance and Game*, eds. Pat Harrigan and Noah Wardrip-Fruin (Cambridge, MA: MIT Press, 2003, 118–30.
[23] Jenkins, "Game Design as Narrative Architecture," 123.

adventure games follow this model, particularly if games offer branching narratives that depend on player choice.

(3) *Embedded narratives.* An embedded narrative is considered "less a temporal structure than a body of information" that is presented to the player. For Jenkins, the idea of an embedded narrative in games turns these games into "a kind of information space, a memory palace."[24] In this way, game designers guide players toward narrative understandings in various ways. The game *Myst* (1993) is a classic example of an embedded narrative: players explore the world of Myst Island and solve puzzles to piece together character stories. The game *Journey* (2012), analyzed later in this chapter, is another example of a story discovered through problem-solving and exploration. (Furthermore, we'll see how music offers a way for designers to guide the player toward narrative understandings.)

(4) *Emergent narratives.* These narratives are loosely structured by gameplay but not pre-designed. They *emerge* through the player's acts of play. Simulation games often fall into this category. *The Sims* is an exemplar, in which control is left to players to construct the homes and characters and shape their paths (which are nonetheless limited to the capacities of the computer system). (Of course, narratives might emerge from any sort of game, and this doesn't even include the wide array of "fan fiction" that players engage in.)[25]

[24] Jenkins, "Game Design as Narrative Architecture," 126.
[25] Henry Jenkins has written a good deal about fan cultures. See, in particular, *Fans, Bloggers, and Gamers: Exploring Participatory Culture* (New York: NYU Press, 2006).

Besides all starting with the letter E, these categories are each concerned with mappings between the ludic and the narrative, reflecting a desire to reconcile traditional narratives and game structures by thinking about how formal and aesthetic features of games can give rise to narrative experiences of play. These categories are also preoccupied with *spatial* storytelling. After all, the title of Jenkins's essay is "Game Design as Narrative Architecture"—he sees virtual environments as creating the potential for different kinds of narratives to exist.

As I've discussed, music is often understood temporally (as a sequence of sonic events in time) as well as spatially (whether through spatial analogy or simply the associations formed by location-triggered cues). Does music have a potential role in Jenkins's categories? For one, we could easily imagine how music borrowed from John Williams's scores for *Star Wars* would contribute to *evoking* narratives. The other categories seem to be more concerned with the processes of a story's presentation and the role of players in those processes. As will become clear, music can both accompany and also constitute these processes, thereby enacting its own form of narrative.

Other scholars have seen potential in games to illuminate new kinds of narrative. Where Jenkins starts from the perspective of narrative and games as being separate, but mappable, concepts, Ian Bogost sees video game structures—particularly their *computational* architecture—as a new form of narrative with rhetorical implications. In *Persuasive Games,* Bogost coins the term *procedural rhetoric* to describe the argumentative power of computational systems and the influence that video games can have on players as well as culture more broadly:

> *Procedurality* refers to a way of creating, explaining, or understanding processes. And processes define the way things work: the methods, techniques, and logics that drive the operation of systems, from mechanical systems like engines to organizational systems like high schools to conceptual systems like religious faith. *Rhetoric* refers to effective and persuasive expression. Procedural rhetoric, then, is a practice of using processes persuasively. More specifically, procedural rhetoric is the practice of persuading through processes in general and computational processes in particular. Just as verbal rhetoric is useful for both the orator and the audience, and just as written rhetoric is useful for both the writer and the reader, so procedural rhetoric is useful for both the programmer and the user, the game designer and the player. Procedural rhetoric is a technique for making arguments with computational systems and for unpacking computational arguments others have created.[26]

Games, he argues, have the power to alter attitudes through their interactivity, as players become complicit in the unfolding of video games as computational procedures. A recent example of procedural rhetoric at work (or, at play) can be found in the web browser game *Thoughts & Prayers: The Game* (figure 3.2) which renders the core mechanics of the game ("press T to think and P to pray") as ineffectual against a nationwide epidemic of mass shootings. As players press T or P in efforts to prevent further shootings, the game's events remain unchanged, the system unresponsive (figure 3.3). By embedding mechanics of failed efficacy in the game, the game uses procedural rhetoric to make an argument within the contentious gun control debate in the United States.

[26] Ian Bogost, *Persuasive Games: The Expressive Power of Videogames* (Cambridge, MA: MIT Press, 2007), 2–3.

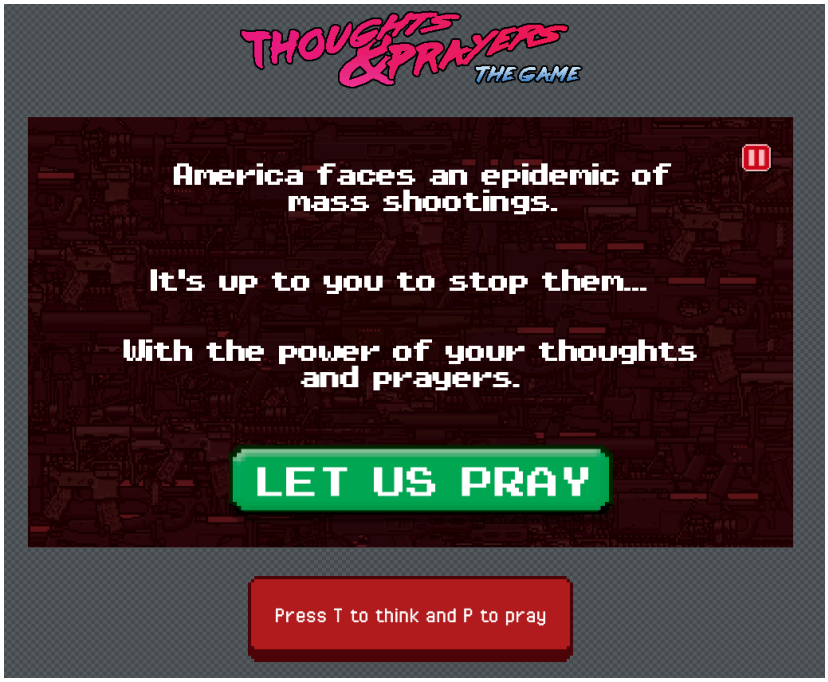


Figure 3.2: *Thoughts & Prayers: The Game*

Figure 3.3: An inevitable ending in *Thoughts & Prayers*

Music is undoubtedly a part of the proceduralism of video games—sound is deployed through computational procedures, as discussed in chapter 1. But the potential rhetoric of music in video games is less clear—for most video games, music is not directly involved in the mechanics of play that Bogost focuses on. Most often, the effects of music are more subtle. In *Thoughts & Prayers,* the music is high-octane rock that resembles the style of music often used in "shoot-em-up" game genres—games that feature *a lot* of gun violence. For those familiar with that genre of games, the music evocatively shapes the image of the United States as a real-life "shoot-em-up" stage, perhaps enhancing the argument about the current state of affairs in US mass shootings.[27]

Musical features in combination with other game procedures can have a rhetorical effect that is not possible *without* music. In the example from *Journey* that I describe later in this chapter, musical changes communicate not just something about the game, but about music itself. In this way, games can have a reciprocal exchange of meaning through procedural logic. But not all games have an immediately legible or predictable logic to their musical procedures. Music for a video game might be generated through pseudo-random procedures, as in the case of *Proteus* (2013), which features a randomly generated world. Each play instance of *Proteus*, then, is a new experience—to an extent. It is still computationally bound, and randomness is limited. *Proteus* always looks and sounds like *Proteus*, particularly to those players who've played several

[27] To dig deep into the Roman origins of rhetoric, perhaps music is part of the *elocutio,* or style, of this argument.

instances of the game. It is thus possible to consider *Proteus* as an improvisation on the same core storyworld.

Figure 3.4: A scene from the procedurally generated environment of *Proteus*

In what follows, I analyze cases from games that reflect short trajectories of play in which meaning develops through various forms of video game narrativity—progress, story, development, unfoldings of worlds, and music. I explore two games that are representative of two different technological eras, the 8-bit and the modern, thereby accounting for music in two paradigms: hard-cut loops, and the smoothly adaptive, cinematic style. *Final Fantasy III* (1990), in the former category, uses music to set affective bounds while gesturing toward a trajectory of narrative progress written into clear-cut musical changes. *Journey* (2012), maps musical progress onto player progress on a finer scale, more directly using notions of musical progression as narrative indicators. I argue for a *ludomusical narrativity* in both cases, in which play is structured by specifically musical forms of narrative that intersect with the game world in various ways.

Final Fantasy III: Basic Ludomusical Narrative Processes

Final Fantasy III, released by Square in 1990 for the Famicom in Japan, features 8-bit graphics and music: five channels of sound generated from frequency modulation, the "chip-tune" sound from which the still-prevalent "beeps and boops" characterization of video game music originates. Nobuo Uematsu composed for the game, which consists of 43 unique musical tracks. The titles of these tracks as translated from the original Japanese range from the banal (e.g., "Opening Theme") to evocative (e.g., "Let Me Know The Truth"), indicating anything from character and location themes to general affects. In play, these tracks are activated across a turn-based adventure story, with a world of characters and monsters. (Figure 3.5 is a screenshot of the avatar (center) on the overworld map, near a town represented by an icon of houses.)[28]

[28] NB: sources for screenshots of *Final Fantasy III* are from playthrough of a fan translation from the original Japanese, as *Final Fantasy III* was not formally released in the US until its remake for the Nintendo DS in 2006. Between the fan translations and the original Japanese, there is no meaningful difference in the basic narrative structure, nor the music.

Figure 3.5: The overworld map of *Final Fantasy III*
(source: gameanyone.com)

One of these monsters is called Jinn (clearly borrowing from the mythological Jinn or "genie" as originating in Arabic mythology). Jinn puts a curse on the town of Kazus, turning the townspeople into ghostly spirits (shown in figure 3.6).[29] The party of characters is tasked with traveling to a cave, then finding and defeating Jinn in battle (figure 3.7). Defeating Jinn will lift the curse of the town and restore the corporeality of its denizens.

[29] The icon of what might appear to be a genie's lamp in the images of Kazus in this chapter are coincidental with the inclusion of a Jinn. Shops that sell healing potions often use the lamp as a symbol, likely derived originally from tabletop role-playing game *Dungeons and Dragons*. (Many thanks to Ryan Thompson for pointing me to the origins of this symbol.)

Figure 3.6: Ghostly outlines of cursed townspeople in Kazus, *Final Fantasy III* (source: gameanyone.com)

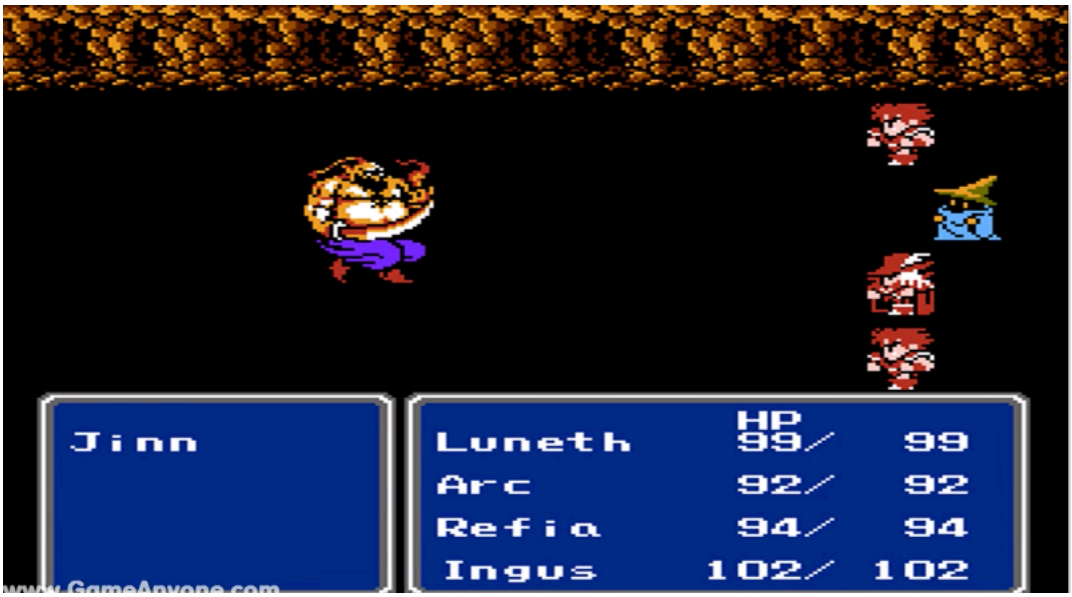
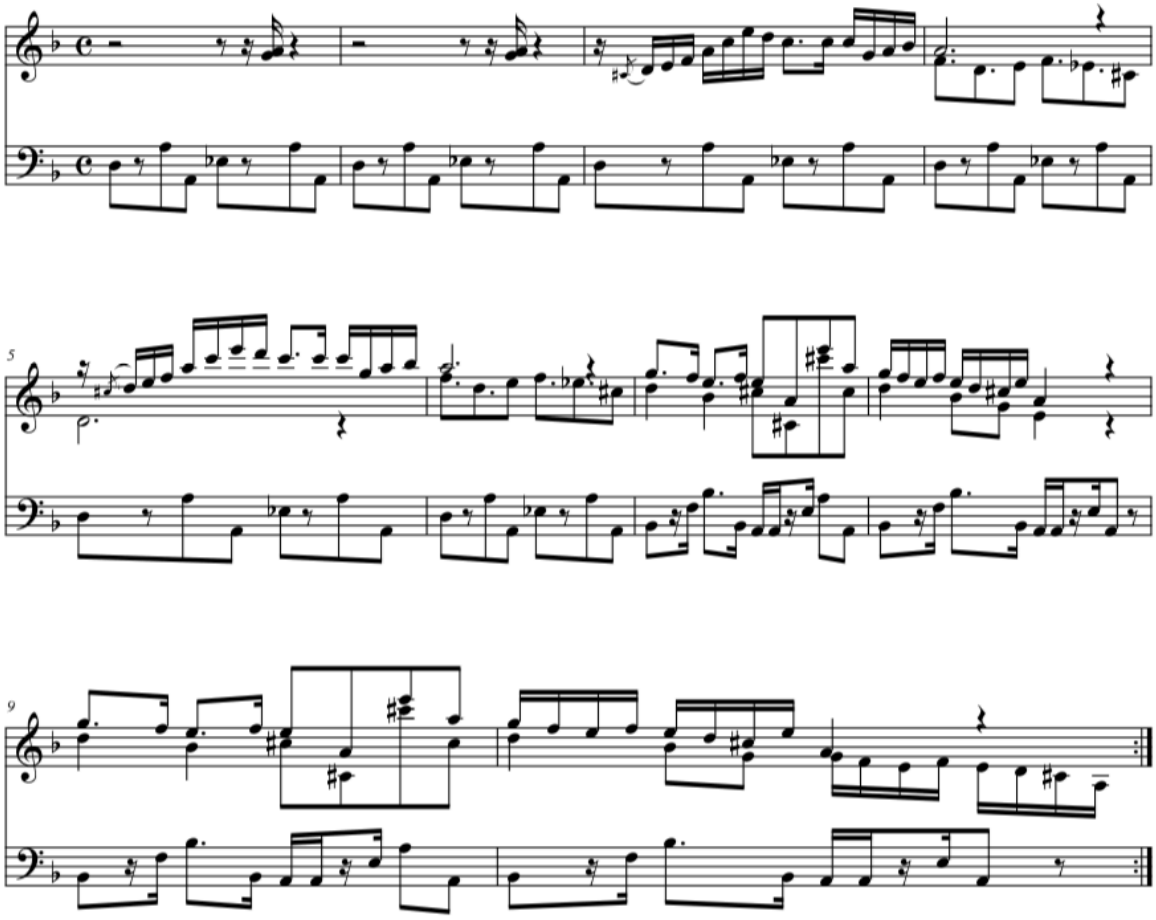


Figure 3.7: Battle with Jinn from *Final Fantasy III* (Famicom). The player's party of characters is lined up on the right to face Jinn, left.
(source: gameanyone.com)

This narrative sequence is accompanied by meaningful musical changes. Most notably, the difference between Kazus cursed and Kazus cured is shown visually, but portrayed more evocatively by differences in the musical cues. Example 3.1 shows the cue for Kazus under Jinn's curse.



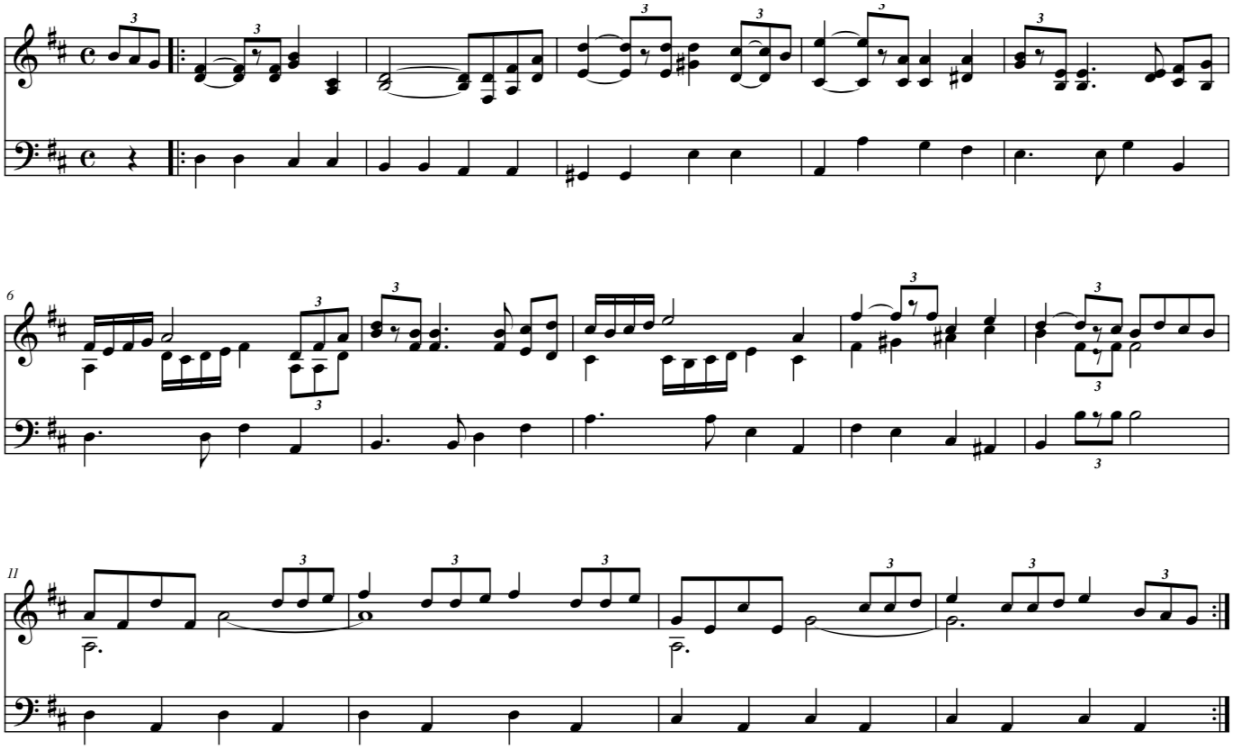
Example 3.1: "Jinn, the Fire," (*Final Fantasy III*). Three channels of sound are transcribed onto two staves.

The music of the curse (a track translated as "Jinn, the Fire") begins sparsely, giving us not much more than a few notes at a slow tempo. The melody helps to situate things in D minor, but that E♭ is pervasive, feeling sometimes like a pre-dominant Neapolitan, and other times just a chromatic upper neighbor that unsettles the tonic. The characteristic habanera rhythm is fully realized by the seventh measure, under a melody and harmony seemingly stuck on Phrygian half-cadences. If we were to analyze this as an *affective zone*, we could imagine that the unsettled D minor places the listener in a similarly unsettled state, while the habanera brings in connotations of Cuban or Spanish dance, perhaps even Bizet's famous habanera from *Carmen*.[30] Alongside the cursed town, however, "unsettled" is the most likely affective possibility from this music, and the player may proceed with caution in a place typically considered safe—towns in these kinds of video games are usually places for rest and regroup.

Once the player has gone off to the cave, found and defeated the Jinn to lift the curse, she can then return to the town with its curse lifted and hear music of a different sort (example 3.2). "Return of the Warrior" is a fanfarish victory march in D major (happily the parallel major of the curse's D minor) with no chromatic uncertainties or lingering on half-cadences—instead it features a harmonic progression longer in scale, decidedly unstuck. Indeed, even the rhythmic framework of the bass stabilizes on strong beats, "resolving" the instability of the bass line in

[30] As William Gibbons discusses, the use of the music (including the Habanera) from Bizet's *Carmen* in video games has been used to connote "Spanishness." See Gibbons, *Unlimited Replays: Video Games and Classical Music,* 26.

"Jinn, The Fire." Both affect and meaning seem straightforward: this is the music of a safe and happy return.



Example 3.2: "Return of the Warrior" (*Final Fantasy III*).

Figure 3.8: Kazus with the curse lifted (*Final Fantasy III*)
(source: gameanyone.com)

Narrativizing the Ludic

The world of *Final Fantasy III* is organized such that the town of Kazus and the cave in which you go to fight the Jinn to remove the curse are two discrete locations on the overworld map (as shown in figure 3.5). On this map, players can move characters between these locations freely. Players can also choose to explore other locations, though there are limitations to this freedom—players cannot access every part of the game at once.[31] Nonetheless, this interactivity in exploration of space is *ludic*; it is an element of player agency. Figure 3.9 offers a basic visualization of this paradigm.

[31] Besides the use of music to guide players in some cases (demonstrated more clearly in *Journey,* as discussed in the next section), games typically constrain exploration in various ways so that the player doesn't jump into an absurdly difficult challenge too early in play.

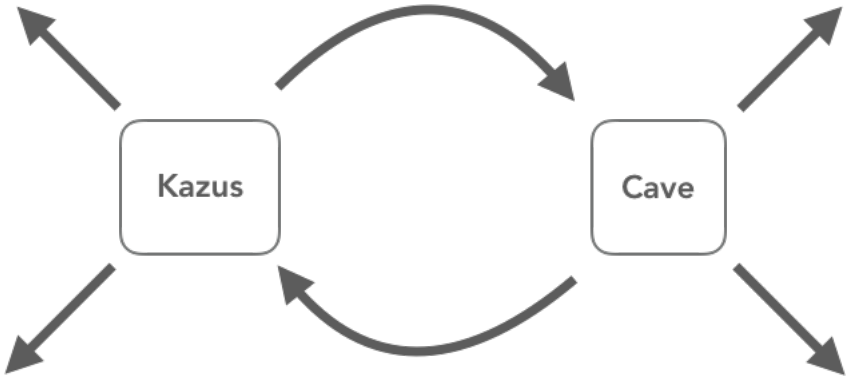


Figure 3.9: A diagram of the "ludic paradigm" between Kazus and Jinn's Cave in *Final Fantasy III*. Players are free to move between these locations, as well as other locations in the game world, in any order they choose.

Now, add in music. Music narrativizes play simply through *changing* in a meaningful way: when the player completes her ludic task (beat the enemy Jinn in battle) and triggers a narrative event (curse is lifted), the music follows that change. The town of Kazus now occupies two points on a narrative timeline (figure 3.10).

Figure 3.10: A diagram of the "narrative paradigm" between Kazus and the cave in *Final Fantasy III*. Musical changes (here as different colors) in Kazus after ludic progress in the Cave portray overarching narrative progress.

This is the connection between the ludic and the narrative that music can mediate, constraining ludic indeterminacy through clearly marked musical resolution. In fact, even if the player defeats Jinn, then stops playing and goes off and lives her life for twenty years, the music

of this town will be the victory theme when she returns, emplacing her right back into narrative structure of a game which otherwise invites ludic exploration. Of course, music is not the only thing that changes—the townspeople return to normal as well. But music is the most immediate change encountered.

Indeed, music doesn't simply linearize play but also creates affective zones, spaces in which potentials for meaning and perception are shaped by these musical differences. The musical changes in Kazus reshapes that space: hearing the cursed habanera might evoke more apprehension in her interactions (is this town dangerous? will I encounter enemies here?), while the victory march might evoke the kind of confidence that Kazus is now a safe town. This is the essence of *ludomusical narrativity*—the potential for music to shape *ludic* actions of play to fit *narrative* affects of story.

Procedural Exoticism

In a reciprocal fashion, playing this section of *Final Fantasy III* and triggering this musical change enacts a *procedural* argument about music itself. Danger and curse are signified by an approximation of Cuban dance music, and the return to "normal" is marked by its replacement with an approximation of a military march. Embedded in this change are some problematic ideologies of music rooted in a history of musical exoticism.[32] The habanera of "Jinn, the Fire" stands in as a signifier of something dangerous, never mind the specificities erased by

[32] See Grove Music Online, s.v. "Orientalism," by Ralph Locke, last modified July 9, 2018, https://doi.org/10.1093/gmo/9781561592630.article.40604.

the conflation of Cuban music and Arabian myth. "Return of the Warrior" is the "western," perhaps colonialist answer that sets the Jinn as an orientalist trope. And this is more than simply musical changes that accompany narrative changes; as in Ian Bogost's concept of procedural rhetoric, *playing* the game effects the computational—and musical—processes that make this argument, creating uncomfortable resonances between this fantasy adventure and the "real" world of imperialism.

Music exoticism in video games and video game music has its own deep history, and this is just one example of myriad cases we could identify.[33] While the main focus of this chapter is the mechanisms by which ludomusical narrativity can function in virtual worlds, it is important to remember that these processes that shape gameplay experiences are not neutral, apolitical, or otherwise isolated from the real world outside the magic circle.

Journey: Ludomusical Narrativity and Aesthetics

The example from *Final Fantasy III* demonstrates how distinct musical change can communicate aspects of narrative and shape the play within the constraints of that narrative. This is a common paradigm in earlier games where the music consisted of static, looping tracks with little adaptability to game state. The technological capabilities of more recent gaming systems allow for more subtle musical changes that give the illusion of a continuous "score" that

[33] For a more in-depth discussion of musical exoticism in video games, focusing on an earlier Uematsu score, see Dana Plank, "The Penultimate Fantasy: Nobuo Uematsu's Score for *Cleopatra no Ma Takara,*" in *Music in the Role-Playing Game: Heroes & Harmonies,* eds. William Gibbons and Steven Reale (New York: Routledge, 2019), 79–96.

follows the player wherever they go and whatever they do. Such games offer fine-grained changes in music that make it difficult to identify sharp affective changes, but the basics of ludomusical narrativity remain the same: music shapes play into narrative understandings.

One example that illustrates this possibility is the game *Journey,* released in 2012 by thatgamecompany, which was a highly acclaimed and best-selling game for the PlayStation 3. It is categorized as much a platformer game as an "art" game, a burgeoning genre finding its footing in small, indie developers (aided by the increased openness of platforms like Steam over the more proprietary worlds of Sony, Nintendo, and Microsoft). Its music, composed by Austin Wintory, is rather cinematically styled, and adaptive to player movement over its world. Unlike the music of *Final Fantasy III*, that of *Journey* features subtler, fine-grained shifts.

The gameplay and story of *Journey* primarily involve movement through desolate spaces toward a mountain peak (figure 3.11) with a handful of obstacles, uncovering a story about a lost civilization (demonstrating Henry Jenkins's concept of "embedded narrative"). At each stage of the *Journey*'s journey, more details are revealed about the circumstances of the world that lay before you: the well-trodden trope of an ancient advanced technological civilization that collapsed at the hands of its very own technologies.

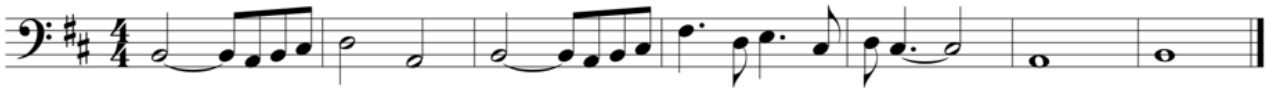
Figure 3.11: The desolate landscape of *Journey*

This story casts a characterful influence through the musical materials of Wintory's score: a mix of electronic sounds and symphonic instruments, with emphasis on cello and bass flute. These musical materials mesh well with *Journey*'s post-apocalyptic landscape and a textless adventure that invites the player to explore the bounds of world made mostly of beautiful landscapes with little narrative material.

Beyond its character, Wintory's score includes adaptive syntactical progressions, which link with player progress: when players find an object or uncover a new area, the music changes accordingly. This adaptability is certainly a staple of video game sound and music design. But

rather than considering this feature solely as a feedback mechanism, we might also consider the musical logic underlying these choices. What is a measure of "musical progress"?

I'll focus here on the third stage of *Journey*, considering the answer to this question as a matter of ludomusical narrativity. In sum, progress in the game is matched in the music through logics of musical *activation.* From the basis of a central theme for solo cello (shown in example 3.3), an accumulation of musical materials follows along with the player's progression through the level, cued to the literal activation of various physical elements of the landscape. General rhythmic activity and instrumentation also increase as the player progresses, as if activating hidden layers of musical spacetime.

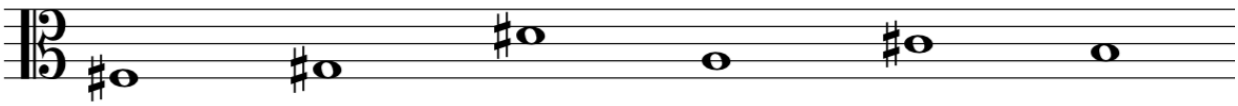


Example 3.3: The main theme of *Journey*, as performed on cello in the track "Nascence"

As players begin stage 3 (figure 3.12), the starting soundscape establishes itself through sound effects, timbres, and pitches that blend together in an ambient a wash of sound. The glimpses of identifiable pitches seem to circulate around a Dorian hexachord that leans on F♯ (example 3.4). Because the player has not yet done anything to progress through this landscape, this music effectively—and affectively—portrays a sense of *beginning* and *possibility*—and perhaps nothingness, a primordial wash of music. The rhythmless, modal sound—lacking in any

particular direction temporally—portrays a sense of musical grounding over which any number musical materials could emerge.

Figure 3.12: The beginning of stage 3 in *Journey*

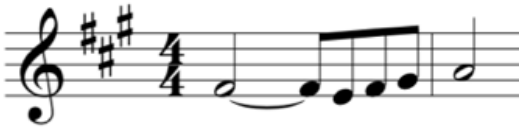


Example 3.4: Dorian hexachord collection in order of appearance in stage 3 of *Journey*

These musical associations are retroactively solidified as progress effects musical change. When the player approaches a floating piece of scarf-like cloth stuck in a device in the sand, they are expected to press a button that creates a kind of magical sonar that activates the power of this

cloth (figure 3.13). The cloth then animates with life, directing the player towards the next destination. The music also becomes animated, with increased rhythmic activity and recognizable motivic noodling in the flute (following the contour of example 3.5). It's just a brief glance of the theme, a sign of life emerging from that F♯ Dorian wash.

Figure 3.13: Approaching (top) and activating (bottom) an object in stage 3 of *Journey*



Example 3.5: The motivic contour "activated" through narrative activation, based on the main theme

After activating a second node in this stage, the music reaches harmonic areas beyond the Dorian hexachord while also *negating* it—a D major chord "unlocks" tonal areas of the F♯ minor theme, imbuing this music with both motivic and harmonic energy. Now the ambient soundscape is turning into something we might follow along with—something with rhythm, with a harmonic progression, a sense of movement.

Journey's interactive world is premised on open, three-dimensional spatial exploration. For the most part, players are allowed to move around between activated and non-activated nodes freely—there is no ludic or narrative consequence to lingering (figure 3.14). But if we apply the logic of *Journey's* musical progression, there indeed *are* consequences, at least musically. When players linger in an area for too long, music will *return* to that original modal wash of sound—motivic noodling will fade, added instruments will recede to silence. These punitive measures of music (pun intended) encourage the player to move along, at least suggesting that they should. As a result, music narrativizes play through its own forms of progression connected to the ludic activation of these nodes (figure 3.15).

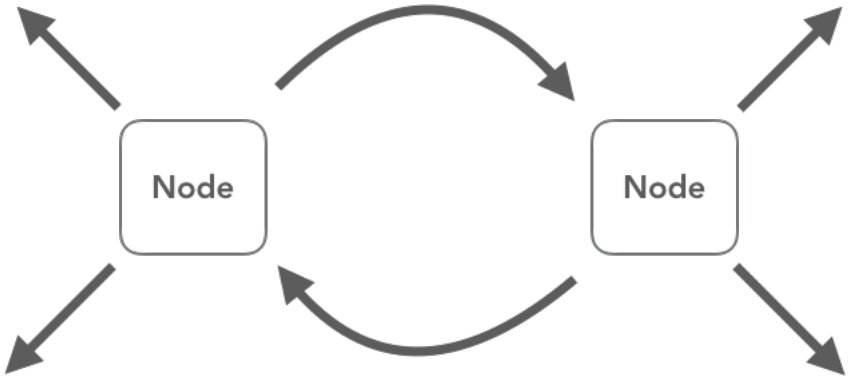


Figure 3.14: A diagram of the "ludic paradigm" in *Journey*. Players can go to any activation node they wish in any order, and travel between each node freely.

Figure 3.15: A diagram of the "narrative paradigm" in *Journey*. Through musical changes, players understand each activated node as one in a progressive sequence.

Ludomusical narrative in *Journey* is not simply how music might shape play in relation to story—there is not that much of a story in *Journey*. Rather, play unlocks a ludomusical narrativity, as players uncover a particularly musical story in the soundscapes of each stage. It follows Henry Jenkins's "enacting narrative" category, where narrative is musical. These associations between game and music—between animation and musical motion, discovery and harmonic fulfillment, etc.—follow a particularly musical logic.

Basis	Stasis	Forward Paces
solo cello theme	modal hexachord meterless wash of sound	motivic and tonal activation; increased rhythmic activity and instrumentation

Table 3.2: Analytical summary of stage 3 of *Journey*

Side Story: *Journey* as an Art Game

Journey is sometimes categorized as an adventure game or platformer, but in many descriptions, it is also considered an "art game" (sometimes written as "artgame").[34] Scholars typically consider art games to be those whose ludic elements—the mechanics, goals, interactive challenges, etc.—are themselves artistically expressive in some way.[35] *Journey* seems to be considered an art game for its artful *aesthetics,* rather than its mechanics. In other words, *Journey* is a beautiful game, with beautiful visuals and beautiful sounds.[36]

But this chapter relies on formal understandings of games, including formal understandings of music. Certainly, language used by game scholars to talk about structures in games rarely accounts for anything aesthetic, affective, or artful. But what if *Journey* is less like a

[34] See Keith Stuart, "Is Journey a game or a piece of interactive art?" *The Guardian,* March 15, 2012 https://www.theguardian.com/technology/gamesblog/2012/mar/15/journey-game-or-interactive-art; Laura Parker, "A Journey to Make Video Games into Art," *The New Yorker,* August 2, 2013, https://www.newyorker.com/tech/annals-of-technology/a-journey-to-make-video-games-into-art.
[35] See John Sharp, *Works of Game: On the Aesthetics of Games and Art* (Cambridge, MA: MIT Press, 2015).
[36] There has been plenty of resistance to the idea that games can be art. For Roger Ebert in 2010, "game" and "art" are actually mutually exclusive categories. "Video Games Can Never Be Art," *Roger Ebert's Journal* (blog), April 16, 2010, https://www.rogerebert.com/rogers-journal/video-games-can-never-be-art.

ludic game, less like a narrative story, and more like a work of art, as it is often characterized? As discussed above, much of the story that is activated by play is a musical story in musical terms. Might there be room in that story to account for its aesthetics?

One rather notable consideration is *Journey*'s multiplayer mode: players with internet access can connect to a network of concurrent *Journey* players, connecting with one randomly chosen anonymous companion at a time. Companions can only communicate through an undifferentiated "ping"—there is no text or voice chat included in the game. And while companions can guide and help one another, there is no task that absolutely requires cooperation—you are simply going through the journey with someone rather than by yourself. Patrick Jagoda has remarked that *Journey* offers affective experiences that "resist description and lead players to feelings of wonder, isolation, and even crying and tears."[37] And many of these reactions seem to be amplified with a companion. Such ability to resist description is the very ineffability that we ascribe to art, which makes it difficult to analyze from traditional game studies approaches. But here, I'd speculate that that music coalesces feelings of togetherness through synchronizing musical progress with your companion. Players frequently aim to complete narrative nodes at the same time (or be in the same space when these narrative events happen), and so together, they uncover the world as it seemingly unfolds through musical procedures.

[37] Patrick Jagoda, *Network Aesthetics* (Chicago: University of Chicago Press, 2016), 73.

The End (for now)

Perhaps there is hope for the Clint Hockings out there who find "ludonarrative dissonance" to be a problem. I won't go so far as to say that music can solve all of our woes, a cliché as old as time, but I do believe that music offers alternative avenues for understand how players experience and understand video games.

In the case from *Final Fantasy III*, I argued that music connects with narrative to shape ludic interactivity, framing play actions through a narrative lens. In *Journey*, I argued that even while there is an *embedded* narrative of technology and apocalypse, the *enacted* narrative is one that is musical. In both of these examples, we might consider how the player's complicity in these ludomusical narratives is a persuasive argument for certain kinds music meaning and syntax. We might think further how this thinking might extend beyond video games. Given typical Western tonal structures, listeners can become acculturated to certain expectations—a V^7 feels like it wants to go to a tonic chord. How might we better understand the *ludic* nature of musical practice when composers or performers *play with* those expectations? Perhaps we can think of the listening audience as owners of a storyworld built from tonal conventions, and the performers are, well, the players.

The next chapter will consider what happens to musical meaning when players play a game *a lot,* becoming adapted to the world and all of its musical design. Such adaptations have the potential to refine and redefine musical meaning both in and out of games, so turn the page to continue along with the stories that music can tell.

Chapter 4
Playful Habits: Ecologies of Video Game Music

Packing Pecks of Picked Peppers

When I was a teenager, summers were spent working on the family farm. I typically worked the cash register at our open-air market, where city folks on their way to the beach would stop for fresh corn and tomatoes. Most of my tasks involved this kind of "front-end" work of selling fruits and vegetables to customers.

But sometimes I would get called to the produce packing house for the "back-end" of sorting fruits and vegetables for shipping. What I remember most vividly was sorting green and red bell peppers as they would tumble down a conveyer belt glistening with droplets after their water bath.[1] Alongside my father and grandfather, with the seasonal workers, I was tasked with sorting these peppers such that only well-formed, totally-green peppers made it through to the end to be boxed and shipped. Any stripe of red flesh, and that offending pepper was taken off the belt. Any wacky shapes (strange folds, protrusions and the like) were also sorted into a separate box. And we always had to keep an eye out for punctures and signs of rot—candidates for the "slop pile."

[1] The title of this section does not contain a typo. The peppers were indeed *picked,* not *pickled.*

Those were the rules, and we would spend several hours before lunch sorting the large pallet boxes of peppers picked from the field that morning, which were tilted onto the conveyer belt to be washed, classified and sent to market. And after just a few minutes of doing this sorting work, I became fast with my hands and with my eyes, seeing the color **red** pop amongst the sea of green. In other words, I had adapted to my simple task. My perceptions were honed to do it well—to notice what I needed to notice to be successful. (And each night, I'd fall asleep as visions of peppers danced in my head.)

These days, I only deal with peppers occasionally when cooking a meal. Nonetheless, the repetitive simplicity of pepper-sorting, with the perceptual honing that results from mastering the task, is a phenomenon particularly applicable to video games. When video games require repetitive, simple actions to win, playing those games to win will lead to facility and familiarity. For example, the game franchise *Bejeweled* (figure 4.1) includes one core mechanic: swap adjacent gems to make vertical or horizontal matches of at least three of the same gem. Players gradually become quicker at noticing match potentials as they become accustomed to the visual layout of the screen and the color and shape of the gems. Their perceptions are honed—they can quickly see which gems afford match-making and which do not.[2]

[2] Players also likely to become more quick-at-hand, not only seeing match potentials more quickly, but also becoming more physically able to making those matches with increasing speed. But I focus here on perceptions rather than physical actions, because speed of play much more directly depends on perception rather than physical speed. (In other words, it matters far more to see where to swap gems rather than how fast I can move the mouse or swipe an inch on my screen.)

Figure 4.1: The virtual game board of *Bejeweled 3*.

Bejeweled 3, the title from the series I'll focus on, is a particularly colorful game, and its bright graphics are matched by vivid audio: gems make a *clink* sound when moved about, and match-making produces a mild yet satisfying explosion. Amidst this soundscape, looping background music, composed by Peter Hajba and Alexander Brandon, accompanies play: synthesized orchestra with some electronic accents, emphasizing a vaguely sci-fi/fantasy aesthetic of the "gameworld" behind the puzzle board in the foreground (see, for instance, the illustration of a stone castle atop the waterfall in the distance behind the board in figure 4.1). The music cues are also designed to reflect various modes of gameplay: for example, timed "Lightning" mode

incorporates music that increases in tempo as the player reaches successively difficult levels, while the untimed "Zen" mode of endless play forgoes metered music with pizzicato twinkling of high-pitched strings over subdued wash of synth pads—smooth and relaxed.[3]

Games like *Bejeweled 3* are "casual" games, demanding little conscious attention or practiced skill from the player.[4] In these games, there is no virtual world to explore, nor a story to follow. The music loops unobtrusively in the background, flowing along with no sharp changes, harsh melodic contours, unpredictable harmonic progressions, or anything of the like. This music likely falls into Winifred Phillips's game music category of "music as a state of mind," featuring simple, repetitive loops that help the player focus on the puzzling tasks at hand.[5]

In a dissertation on music and meaning in video games, casual genres might seem out of place; perhaps they are little more than time passers (or time wasters, to adopt a cynical view). But consider a practiced connoisseur of *Bejeweled 3* who acts much like a worker on a produce packing line, having adapted to a very particular task of matching three identical gems. Their perceptions are honed to see potential matches and act in the proper way to fulfill the "match-3" rule. Unlike the real-life situation of pepper-packing, however, there is music: a consistent, repetitive, predictable set of musical cues. Like the maneuverability of the gems, the edges of the

[3] Other modes include "Classic" mode, in which the player's goal is to make matches until there are no more moves left; "Poker," a *very* loose adaptation of the card game, that turns potential matches into hands (making five successive matches of the same gem is a "Flush," for instance); "Butterfly" mode, where special butterfly-shaped gems must be matched or else face eventual death by spider; "Quest" mode which offers a series of different puzzles, progressively more difficult; "Diamond Mine" mode where matches explode to unearth buried gems and other treasures; and "Ice Storm," another speed-based mode dealt with later in this chapter.
[4] The game's core matching mechanic is common enough as to classify an entire genre of "Match-3 games."
[5] Phillips, *A Composer's Guide*, 99.

game board, and the rules for scoring points, the music is a constraint that intersects meaningfully with other aspects of the game, enlivened by play. How can we understand musical meaning at this state of perceptually honed, mastered interaction? And how might this observable phenomenon in casual genres help us understand similar phenomena—and meaning—in more complex games?

My answers to these questions implicate ontological questions of video games and video game music. In this dissertation thus far, I've not taken a strong stance about how to conceptualize music in video games, but rather laid out ways in which players could experience the music in some meaningful way. When game players master the interactive interface, develop expectations for the musical sounds in gameworld, and otherwise *inhabit* game spaces as if second-nature, there is reason to reconsider the status of "video game music" as such. We might imagine, for instance, that someone playing the same mode in *Bejeweled 3,* for an hour or so, no longer perceives the music in the same way as she did when she started playing. Indeed, what about the player who has logged hundreds of hours over the course of a few months?[6] Is music then still functioning actively as a "state of mind" that facilitates puzzle-based play, as in Phillips's categorization? Maybe. But perhaps players who are significantly experienced with the game begin to conceive of music as part of a larger system that constitutes that game. In other words, at

[6] A disclosure: I have logged over 500 hours of play in *Bejeweled 3* as of this writing (and, sometimes, *in lieu* of this writing). Yes, some facts are best hidden in footnotes.

this stage, *Bejeweled 3* is perhaps less of a multimedia object and more of an *ecology,* a specialized environment for interaction that happens to include a great deal of music.

In this chapter, I will consider implications on musical meaning in video games when players have adapted to the game—a stage of play at which video games can be considered musical ecologies. First, I will describe the phenomenon of what I call "habituated play," and what that implies for perception, generally. Then, I'll move from perception to conception: arguing for video games as (musical) ecologies as understood by players engaged in this stage of habituated play. Then, I will analyze music from several games to demonstrate how an ecological conception can shape musical meaning in particular ways. In these analyses, I follow other music theorists in borrowing from conceptual blending theory to describe how music offers resources for creating novel concepts blended with elements of games. The formation of these novel concepts is not merely a result of constant associations between music and game, but rather facilitated by play as an act of meaning construction.

Habituated Play: Adapting to Virtual Environments

Previous chapters assumed a rather standard kind of encounter with video game music—that the player would be hearing it for the first, or fifth, or twentieth time while playing through a game, perhaps during a sustained play session of an hour or two at a time. At this stage, music may or may not be attended to, but as I've discussed, music offers potentials for meaning nonetheless. For example, a player might hear and understand the brassy, military style and

genre markers of the Hyrule Field music from *The Legend of Zelda* (discussed in chapter 2), and her interactions might then reflect something about the heroic-fantasy affect of such a track. Similarly, the player of *Final Fantasy III* might immediately understand that something is different in a town that features relatively unique music (as discussed in chapter 3). These understandings of musical meaning within the context of the game do not necessarily rely on having adapted in any way to the game itself, as they draw from rather simple, common musical associations that can be mapped onto the mechanics and narratives of games. The heroic-fantasy affect of the Hyrule Field cue in *Link to the Past* is similar to music in other fantasy multimedia; the notion of musical difference indicating narrative change in *Final Fantasy III* is one of the most basic paradigms of musical function in video games.

But beyond these encounters, the actions of *playing* a video game involve learning the ins and outs of how the game *works*—how to interact with the interface, the causes and effects of actions and events, and what music plays when and why. This learning process was described in chapter 1—our cognition is extended into virtual environments, as we feel out the possibilities and limits of actions through attempting those actions. Eventually, players will develop the skills to interact with the game with a certain level of facility. Of course, there is variability in this learning process, depending on a number of factors between the player's abilities and the complexities of the game's interactive design. I am also deliberately conflating the act of learning

the *physical controls* for a game and the act of learning the *virtual physics* of a game.[7] I want to focus here rather on when the player has already learned these aspects of the game, and has reached a level at which they feel at ease in their interactions. In other words, even if the game still presents certain ludic challenges, the player no longer needs to consciously think about which button to press, how "jumping" works in the particular gravity of the virtual world, or what kinds of sounds and music will be heard.

I call this stage "habituated play," reflecting the level of familiarity a player has with the game such that their actions in the environment and perceptions of that environment are second-nature. A habituated player of *Bejeweled 3* makes matches of gems without thinking "what button do I press?" She thinks not much at all, seeing potential matches quickly and acting upon them. Habituated players of a more complex game like *Link to the Past* are also at home with the controls—they might automatically press a button to swing a sword upon seeing an enemy, and they have a sense for the exact radius of that swing, for instance. I'll reiterate that, even at this stage, either *Bejeweled* or *Zelda* can offer new challenges that *do* require conscious thinking—indeed, some games exploit the possibilities of procedural or random generation to essentially shuffle elements of the game design for each play instance (for example, *Proteus*

[7] Indeed, I'm conflating a good deal if different kinds of learning that can be involved in playing a video game, but only certain types of procedural learning matter to describe the stage of habituated play for this chapter. However, other forms of learning, namely narrative comprehension, can be implicated through a process of conceptual blending between music and game—a phenomenon described further along in this chapter.

mentioned in chapter 3).[8] But the player is nonetheless accustomed to the interactive possibilities for a game, even amongst the many potentials of randomly generated environments.

Habituated Play and Stimulus Habituation

This concept of habituated play may share some aspects with the phenomenon of stimulus habituation, which I will clarify here, borrowing a definition from David Huron.

Writing about habituation and repetition in music:

> When something is novel, it makes sense that an organism should direct its attention towards it. However, most of the sounds encountered in daily life do not warrant much mental effort. One of the most important mental mechanisms organisms have for ignoring stimuli is *habituation*—the brain's version of "been there, done that." Habituation is regarded as the simplest form of learning. Formally, habituation is defined as a decrease in responsiveness resulting from the repeated presentation of an eliciting stimulus. With successive repetitions of the same sound or sound–pattern, a listener becomes progressively less responsive to the stimulus.[9]

Huron further notes that habituation to a stimulus should not be confused with sensory adaptation, which involves a slowing of neuronal firing due to a constant presence of a stimulus. (For instance, after sitting in a chair for a long time, pressure-sensing cells will fire less often in skin that is in contact with the chair.) Rather, habituation is an *attentional* phenomenon, whose mechanism is centralized deeper in the brain rather than the peripheral sensory system. Our *responses* to certain stimuli—not necessarily our *perception* of them—are reduced through

[8] A popular genre of this style is *roguelike* games, which typically feature an explorable environment of procedurally generated design and events. The genre is named after the 1980 game *Rogue* which featured randomly generated dungeons created with ASCII characters.
[9] David Huron, "A Psychological Approach to Musical Form: The Habituation–Fluency Theory of Repetition," *Current Musicology* no. 96 (Fall 2013), 9.

repeated exposure.[10] (Such a phenomenon is thought to be a matter of using cognitive resources more efficiently.)[11] For example, people who live in a city become habituated to most "city sounds"—traffic, construction equipment, large groups of people, dogs being walked, sirens, etc.—and these sounds no longer draw focus after a while. Similarly, rural dwellers are habituated to other kinds of sounds (of bugs, animals, farm equipment).[12]

Huron's discussion of habituation is extended to encompass theories of musical form and composition, so I'll now turn back to video games.[13] Video games are, of course, complex audio-visual media in which attention can be directed in multiple ways, and where learning is more complex than a matter of a habituating to a single stimulus. I nonetheless use the term habituation to capture an aspect of video game play that is common and typical, due to the repetitive nature of various aspects of video games, particularly interactions. (How many times has a habituated player of *Bejeweled 3* swiped to make gem matches? Likely thousands.)[14]

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[10] Not all stimuli have the same potential for habituation. Typically, more intense stimuli (louder noises, stronger smells) take longer to habituate to. Painful or feared stimuli also resist habituation. (See Huron, "A Psychological Approach to Musical Form," 11–12).

[11] See David A. T. Siddle, "Orienting, Habituation, and Resource Allocation," *Psychophysiology* 28, no. 3 (May 1991).

[12] Having grown up on a farm and now living in Chicago, I rehabituate to the sounds of the farm whenever I travel home, but only after at least one sleepless night full of cricket chirps and bird calls. Returning to the city, I need to rehabituate to sirens and revving motorcycle engines on the streets outside my apartment.

[13] Huron goes on to discuss when repetition induces pleasure through familiarity; this phenomenon is called *processing fluency*. Habituation and processing fluency are seen as somewhat oppositional (as habituation would seem to reduce any response whatsoever, including pleasure). He uses the two to describe some of the underlying phenomena behind composing repetition in various genres throughout history. (Huron, "A Psychological Approach to Musical Form.")

[14] *Bejeweled 3* keeps records of the number of gems matched over all hours of play. In my case, I've matched over 3 million gems, which indicates that I've thus far made between 700,000 and 1 million individual moves.

But to understand music at the stage of habituated play, we should consider how players habituate to music itself, given the repetitive nature of video game music. Such a phenomenon is made more likely when music loops in *exact* repetition, as it often does in video games. In other words, players often tune out looping video game music, turning their focus to the tasks at hand until some musical change elicits an attentional response.[15] But just because music is not at the forefront of attention does not mean it has "disappeared" or otherwise failed to be perceived—again, habituation is not the same as sensory adaptation. Rather, repeating music effects a shift in attention, and thus in neural processing.

Elizabeth Hellmuth Margulis has described how musical repetition causes the brain to shift gears, switching musical processing from the cortical areas of attention and consciousness to subcortical areas of motor control in the basal ganglia:

> Broadly speaking, musical repetitions push processing down from the more cognitive, conceptual regions of the frontal cortex and into the more motoric, automatic basal ganglia. Encoding passages as sequences, where the first bit is tightly connected to the second, which is tightly connected to the third, and so on until a point of rest, allows an entire phrase or section to be passed through with a degree of automaticity, such that the listener's attention is free to move up or down in the temporal hierarchy.[16]

[15] Dana Plank has written about this perceptual receding in her dissertation, "Bodies in Play: Representations of Disability in 8- and 16-bit Video Game Soundscapes" (PhD diss., The Ohio State University, 2018). Using the term "psychological silence," she analyzes games in which habituation to music and sound leads the player to turn their thoughts inward, giving "a certain kind of permission to internalize and personalize the narrative" (95). The idea that repetitive music allows for the listener to recede into their own thoughts is part of Hurons theory of habituation-fluency, evincing the "trance" strategy of composition. ("A Psychological Approach to Musical Form," 22).

[16] Elizabeth Hellmuth Margulis, *On Repeat: How Music Plays the Mind* (New York: Oxford University Press, 2014), 74.

As stated earlier, in video games, "the listener's attention" is likely off of the music—they tune it out to focus on the tasks of the game. Exceptions include any music-based game or games with musical tasks for which listening to music is important to success—musical attention is implicated in these cases in interesting ways, a discussion of which is beyond the scope of this chapter.[17] Margulis's points are nonetheless intriguing; habituated music is processed in regions that automate our responses, particularly motor responses. Music in this case doesn't disappear, it instead becomes *automatic*, as do our responses to that music.[18] As this music sinks into automaticity, it is worth considering how it plays a role in the interactive ecologies that players adapt to when they play video games. In the next section, I will describe how video games can be considered musical ecologies at the stage of habituated play.

Musical Ecologies in Video Games

Likely the most referenced scholar on music and ecology is Eric Clarke, whose *Ways of Listening* argues for a theory of musical meaning that is essentially drawn from theories of

[17] For one, most music-based games require some kind of rhythmic entrainment, often according an embodied listening to metrical and hypermetrical structures in order to press the correct button at the correct time. See Peter Shultz, "Rhythm Sense: Modality and Enactive Perception in *Rhythm Heaven*," in *Music Video Games: Performance, Politics, and Play,* ed. Michael Austin (New York: Bloomsbury Academic, 2016), 251–73.

[18] It is worth noting that habituation is not, of course, a permanent process—when the habituated stimulus is removed, we return to a base state of dishabituation—a process called "spontaneous recovery." But habituation, as a form of learning, is like riding a bike—once we've been habituated to some stimulus, we can more quickly become *re*habituated to that same stimulus; this is called "potentiation of habituation." (Huron discusses these phenomena as they pertain to musical repetition in "A Psychological Approach to Musical Form," 9–13.) To extend this to habituated play: players who might have played a game enough to become a habituated player can return to the game after a hiatus and more quickly adapt to the environment, having learned it previously.

perception. Clarke borrows from psychologist James J. Gibson (whose work focused on visual perception) to make the case that music perception is contextualized by environmental attributes (e.g. spatial location, sound source, and the less immediate concept of *cultural environment*).[19] In sum, Clarke argues that musical meaning is predicated on our adaptation to the environment in which we perceive that music.

Video games offer alternative environments to which we can adapt, while also resonating to varying degrees with our "real-world" environments—a game with intuitive mechanics allows the player a smooth transition into the virtual world with minimal frustration.[20] (As discussed in chapter 1, the term *mechanics* comprises the possibilities for meaningful interaction in a game.) In this way, more "realistic" games might mimic "real" environments not just in aesthetic design but also in interactive possibilities. More fantastical, abstract, or conceptual games might offer unusual physics in otherworldly environments.[21] These differences also implicate the player's avatar, if there is one—avatars that are realistically human might reflect the possibilities and

[19] See Eric Clarke, *Ways of Listening: An Ecological Approach to the Perception of Musical Meaning* (New York: Oxford University Press, 2005).
[20] Relatedly, the term *game feel* (coined by game designer Steve Swink in an eponymous monograph) refers to the particular *feelings* of interaction, feelings that implicate mechanics, feedback, and design to improve game feel. While Swink makes considerable use of comparing aspects of interactive design with the design of *musical* instruments, he does not offer a robust consideration of video game music per se. See Steve Swink, *Game Feel: A Game Designer's Guide to Virtual Sensation* (Burlington, MA: Morgan Kaufmann Publishers, 2009).
[21] Developers have used interactive frustration and non-intuitive controls as a meaningful constraint (typically in "indie" video games). In chapter 3, I mentioned the browser game *Thoughts & Prayers,* in which the player's interactions, labeled as "thoughts and prayers," frustratingly do nothing to prevent the narrative of persistent mass shootings. Other games that use frustrating mechanics include *Celeste* (whose difficulty is meant to reflect the difficulties of mental illness), and Anna Anthropy's *Dys4ia* (whose difficulty is meant to reflect the experience of gender dysphoria).

limitations of a human body, while nonhuman avatars might offer other possibilities.[22] (Nonetheless, in service of intuition and ease of control, designers might still allow for weird and wacky avatars to "map" easily onto typical human proprioception.)[23] While we use the term *mechanics* to describe *actual* possibilities for interaction in a game environment, the term *affordances* is also used to describe the *perceived* possibilities for interaction, and derives from Gibson's ecological approach. I've used the concept of affordances throughout this dissertation to describe how music shapes those perceptions, and it is otherwise common terminology in both game studies and game design.[24]

The perspective I've taken so far in discussing affordances does not assume adaptation to *video game* environments, because music can shape the perceived possibilities for interaction

[22] *Second Life* offers probably the most realistic environments, designed to appear as actual locations in the real world. But even fantasy games often offer customizable avatars with an assortment of options (down to ear placement and personal whistle pattern)—*Monster Hunter World* and *Red Dead Redemption 2* are two examples. Meanwhile, avatars like Pac-Man are barely humanoid, and in *Katamari Damacy,* your avatar is a rolling "snowball" of objects. (It might also be argued that the controllable tetrominoes of *Tetris* constitute an avatar of sorts.)

[23] The issues and politics of avatar design are manifold, and shouldn't be swept under the rug, even as this note is swept under the text. Diversity in character representation is a hot-button issue in the game industry, and one that ripples through ludomusicology: see Hyeonjin Park's essay, "The Difficult, Uncomfortable, and Imperative Conversations Needed in Game Music and Sound Studies," *Journal of Sound and Music in Games* 1, no.1 (2020): 87–94. Daniel Lipson, in analyzing the growing genre of "empathy" games, coined the term *speculative capacitation* to refer to video games offering new possibilities for bodily inhabitation. Lipson critiques the assumption that empathy games often rely upon: that experiences can be inconsequentially mapped between bodies as a matter of simple informatic exchange. See Lipson, "Speculative Capacitation: Remediation, Bioinformatics, and the Politics of Empathy Games" (MA thesis, University of Chicago, 2018).

[24] As described in chapter 1, applications of affordances in game design tends to follow Don Norman's approach, which comes from the perspective of designing objects for interaction, rather than visual perception vis-à-vis Gibson. Some scholars, however, adhere closer to Gibson's idea of affordance as a flow between environment and perception. (cf. Jonas Linderoth, "Beyond the Digital Divide: An Ecological Approach to Game-Play," *Transactions of the Digital Games Research Association (ToDIGRA)* 1, no. 1 (2013), http://todigra.org/index.php/todigra/article/view/9/7.)

even upon the first encounter with that environment. This does not necessarily mean that music is perceived as part of the ecology of a game. Rather, I posit that players must have adapted to the game environment (even if that adaptation happens quickly), reaching a stage of habituated play, in order to perceive music within a larger ecology of the game. Without this adaptation, players are coming to the game with external habits in play; while all players come to games with "real-life" environmental adaptations at hand, they might also come with habits from *other* video games.

For example, let's consider the *Super Mario World* example from chapter 2, whose basic affordances I also described in chapter 1. Coins are placed in positions that afford their "getting." (We might also draw on Eric Clarke's conception of cultural environment to explain why coins afford acquisition in a capitalist society.) Platforms in the levels are designed to afford jumping-upon. These affordances are meant to be, to an extent, intuitively perceived by a brand-new player. But some coins are floating in the sky, seemingly out of reach. Here's where learning and adaptation come in—the player learns how to use platforms to reach the coin, such that the seemingly out-of-reach coin will no longer be perceived as such. After learning how to make use of those platforms, the coin simply affords "getting" under the specified adaptations within the game. The habituated player need not mentally register the steps to getting that coin, involving maneuvering about platforms and judging jump distance.

Several game scholars have already taken an ecological approach to video game music, which I'll summarize here. Importantly, these approaches *assume* the kind of habituated play that

allows players to perceive music as a part of an interactive game environment rather than background to a task.

Michiel Kamp, extending Mark Grimshaw's prior work on acoustic game ecologies, takes a similar approach to affordances as I did in in earlier chapters: that music can shape the perception of interactive affordances in a video game environment.[25] Grimshaw's dissertation, focusing on soundscapes in first-person shooter games, developed from a Gibsonian perspective of perception: sound in video games allows the player to *perceive* different spaces.[26] Grimshaw limits his acoustic ecologies to sounds emanating from the gameworld—in other words, *diegetic* sounds. Kamp's intervention is to argue that so-called "non-diegetic" music can *also* be considered a part of the ecologies of video games, because they play a functional role (such as "danger music" alerting the player to danger, a common feature of first-person shooters).[27] Grimshaw, along with Tom Garner, later expands the concept of virtual ecologies to include theories of embodied cognition in order to account for physiological aspects of sound perception that may play a role in environmental perception generally, but music does not play a role in their model.[28]

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[25] Michiel Kamp, "Musical Ecologies in Video Games," *Philosophy & Technology* 27, no. 2 (June 2014), 236.
[26] Mark Grimshaw, "Acoustic Ecologies in First-Person Shooters" (PhD diss., University of Waikato, 2007), iii. He argues that sounds (though not music) create *resonating spaces* that itself affords certain action—similar in some ways to my concept of *affective zones* from chapter 2.
[27] The implicit argument in Kamp's essay might actually be about the nature of diegesis—that because music can function as seemingly part of the game world and also beyond it simultaneously (as part of a video game ecology), then perhaps the classical notion of diegesis is inappropriate for video games.
[28] Mark Grimshaw and Tom Garner, "Embodied Virtual Acoustic Ecologies of Computer Games," in *The Oxford Handbook of Interactive Audio*, eds. Karen Collins, Bill Kapralos, and Holly Tessler (New York: Oxford University Press, 2014), 181–95.

Kamp's analytical examples show how music can shape perceived affordances of the video game environment at hand, but the player's particular relationship to the environment is largely unspecified. In analyzing the first-person shooter *Unreal,* Kamp assumes a knowledgeable player who has adapted to how music functions to indicate danger, and acts accordingly when hearing certain cues—a novice player might not necessarily react in the same way, particularly if they were still learning *how* to play, or were otherwise unfamiliar with the scoring conventions of the first-person shooter genre. Meanwhile, in a discussion of *Tetris,* it does not seem to matter whether the player has adapted to the game or not—the music is said to add "a certain indeterminacy in the player's experience of the time played so far."[29] Kamp briefly mentions how affordances can change as players "learn more about a game" (i.e., become more familiar with the game as a whole), though this process is not accounted for in any systematic way in his analyses of the music.

Kamp's discussion ends on music/rhythm games, in which music is directly associated with gameplay—players of games like *Audiosurf* and *Guitar Hero* rely on rhythmic entrainment and other musical cues to successfully complete these games' challenges. Kamp tosses a seemingly throwaway line about the musical puzzle game *Chime*:

[29] Kamp, "Musical Ecologies in Video Games," 245.

> On the one hand, as the music is a by-product of the player's progression through the game and the game's goals do not require direct interaction with the music (such as "playing" the melody by placing blocks in particular ways), music does retreat into the background of the game's ecology and perceptual environment. On the other hand, the close mapping of gameplay onto music means **the music does not so much afford playing the game as playing the game affords making the music**.[30] (emphasis mine)

This chiastic switcheroo need not only describe music games that offer mechanics for making music. "Making the music" also implies a broader ontological notion of ecology, as player adaptation constitutes the perception of music as part of the environment. This highlights the reciprocity of meaning that is implicated when music is considered in ecological terms: player and the play environment *resonate* (in Gibsonian terms) with each other as the player adapts to the game.

Having established a basis for an ecological notion of video games at the state of highly adapted, habituated play, I will consider a few cases of musical meaning more directly. In what follows, I borrow theories of conceptual blending to expand on music-game ecologies, positing a way to understand how music in video games is a resource for novel concepts of meaning that might shape our perceptions beyond these virtual worlds.

Conceptual Blending and Cross-Domain Mapping

When players are engaged in habituated video game-play, they have adapted to the game such that it is perceived as a virtual environment in which music is functionally combined with

[30] Kamp, "Musical Ecologies in Video Games," 247.

other elements. In this sense, the function of a "danger" cue is to alert the player that danger is nearby. Hypothetically, if the danger cue is stylistically incompatible with a "dangerous" situation (perhaps an upbeat waltz in a major key), it may draw attention to itself, but habituation will nonetheless ensure that this cue will be learned to mean "danger" in some way. Such a situation is rather rare, of course. As I mentioned earlier, game developers aim to design intuitive interactive control mechanisms, and this notion can be extended to musical design, which tends to be only markedly out-of-place when there is reason to draw player attention.[31]

I have argued throughout this dissertation, particularly in chapter 2, that a game's designed musical functions are only one avenue of meaning, and how music is a form of *constraint* on meaning, rather than a determining factor. In this section, I consider music to be a bit less, well, *constraining*: how can we consider music to offer *possibilities* for novel meanings to arise? At the stage of habituated play, players are immersed in what can be considered rather novel environments, even if those environments draw from aspects of the "real" world. Music becomes part the player's mental conceptions of these environments, potentially in ways that go beyond simple association.

Let's take an example from the opening of chapter 1: Golbez's musical theme from *Final Fantasy IV,* featuring a quotation of J.S. Bach's Toccata and Fugue in D minor. In that chapter, I discussed how there could be a reciprocal exchange of meaning between Golbez's music and

[31] Because of the ubiquity of music in most video games after the 1970s, the strangest thing to hear might be *silence,* often used narratively to mark important moments. See Plank, "Bodies in Play," 78–91.

Bach's work. Such an exchange would be more and more likely as the player continues to play, long enough to adapt to the consistent association with the fugue subject with the character of Golbez.

Beyond the potential for such richness in added meanings, we could describe how the music actually *constitutes* the character of Golbez. Golbez's characterization as a particular kind of villain is made possible by resources particular to music, and particular to the Bach quotation. By directly referring to Baroque stylistic elements—the 16th-note figurations and organ sound, in particular—the music imports the conceptual connotations of that music: the learned nature of counterpoint, the sense of technical virtuosity, and the hallowed associations of the church organ. These meanings from the music combine with a concept of villain: evil, scheming, and powerful. Together, these concepts help constitute Golbez as a particular kind of villain, one with measured control, scheming subterfuge, and grand plans. In sum, Golbez's theme is not arbitrary, solidified as meaningful through mere association. Rather, music offers explicit resources for players to conceptualize Golbez's character.

In order to account for this phenomenon, I'll borrow from conceptual blending theory, as derived from cognitive linguistics. First developed by Gilles Fauconnier and Mark Turner, conceptual blending theory describes a cognitive process of meaning making between different domains of understanding.[32] According to Fauconnier:

[32] See Gilles Fauconnier and Mark Turner, *The Way We Think: Conceptual Blending and the Mind's Hidden Complexities* (New York: Basic Books, 2003).

> Conceptual blending is a basic mental operation that leads to new meaning, global insight, and conceptual compressions useful for memory and manipulation of otherwise diffuse ranges of meaning. It plays a fundamental role in the construction of meaning in everyday life, in the arts and sciences, and especially in the social and behavioral sciences. The essence of the operation is to construct a partial match between two inputs, to project selectively from those inputs into a novel 'blended' mental space, which then dynamically develops emergent structure.[33]

Conceptual blending is commonly visualized by conceptual integration networks (CINs), as shown in figure 4.2. A typical CIN begins with correlated two *input spaces*. Concepts from these input spaces are then blended together in a third space (the *conceptual blend*), resulting in novel new concepts. A fourth space—the *generic space*—captures the essential features of all of the mental spaces in the CIN, and thus serves as a guide for the process of conceptual blending proper.

[33] *The Encyclopedia of the Social and Behavioral Science,* s.v. "Conceptual Blending" by Gilles Fauconnier (2000), *Science* http://www.cogsci.ucsd.edu/~faucon/BEIJING/blending.pdf.

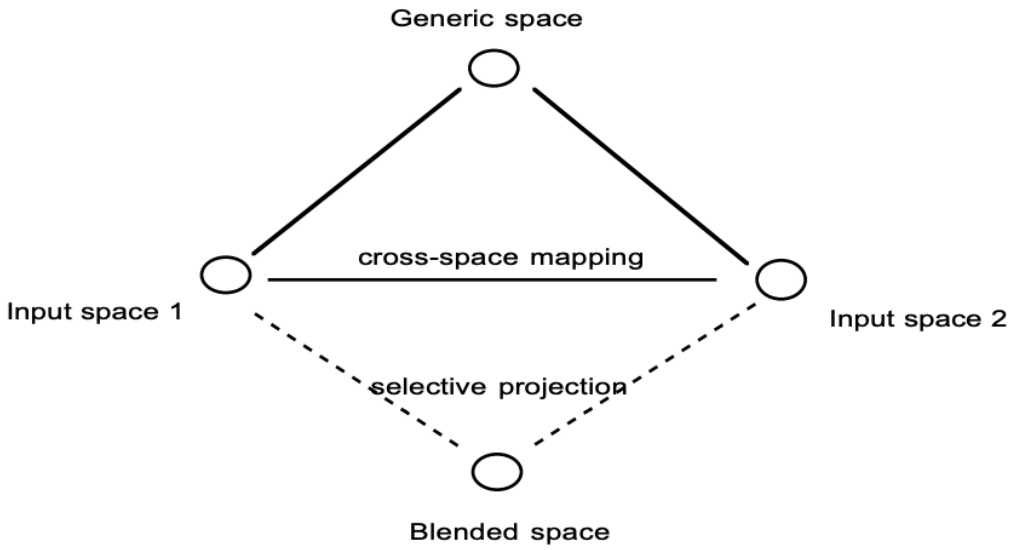


Figure 4.2: Gilles Fauconnier's model of a Conceptual Integration Network (source: http://www.cogsci.ucsd.edu/~faucon/BEIJING/blending.pdf)

Conceptual blending theory has been useful for music theorists, helping to describe why and how we can make connections between music and language when we write analyses. These analytical applications were taken up by Lawrence Zbikowski, who has also used this theory to help describe aspects of musical multimedia, and whose work I'll mainly rely on here.[34] One of the central aspects of this theory is the notion of cross-domain mapping, a phenomenon used to describe how we conceptualize linguistic metaphors.[35] Cross-domain mapping allows us to easily understand a statement such as "this dissertation has *raised* my spirits"—a sentiment that maps

[34] Lawrence Zbikowski, *Conceptualizing Music: Cognitive Structure, Theory, and Analysis* (New York: Oxford University Press, 2002).
[35] See George Lakoff and Mark Johnson, *Metaphors We Live By* (Chicago: University of Chicago Press, 1980). In *Conceptualizing Music*, Zbikowski offers an overview of the theory starting on page 65.

the domain of emotions onto the domain of verticality. Zbikowski offers an example of this cross-domain mapping in music through Palestrina's text painting in *Pope Marcellus Mass:* the textual notion of "descent" is accompanied by a descending melodic line.[36]

Domains can be quite rich themselves, and culturally specific. For instance, Zbikowski cites ethnomusicologist Steven Feld's work in describing how the Kaluli of Papua New Guinea use concepts derived from the different types of waterflow to conceptualize pitch relationships.[37] The cross-domain mapping of conceptual blending can thus be quite complex, depending on the cultural context—or the environment—to which we are adapted. As I've discussed in this chapter, this adaptational process is particularly interesting for musical meaning in video games. Let's return again to Golbez's theme, this time modeled in a conceptual integration network (figure 4.3).

[36] Zbikowski, *Conceptualizing Music*, 64.
[37] Steven Feld, "Flow Like a Waterfall: The Metaphors of Kaluli Musical Theory," *Yearbook for Traditional Music* 13 (1981): 30–31. As discussed in Zbikowski, *Conceptualizing Music*, 67.

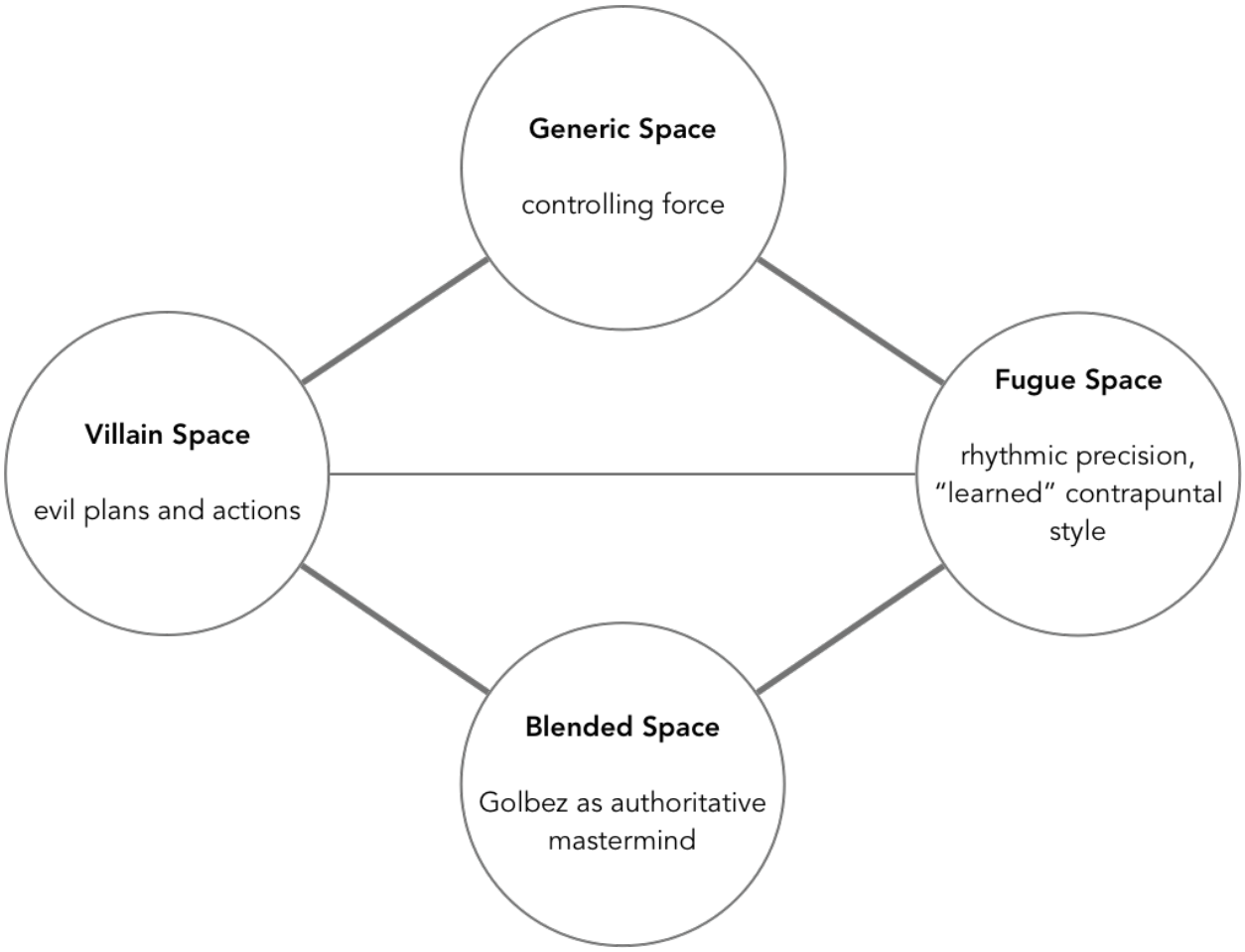


Figure 4.3: Conceptual integration network for Golbez's character (*Final Fantasy IV*)

Through the shared, generic notion of a "controlling force," the domains between the fugue element of the music (on the right) and the concept of a villain (on the left) map to project aspects of Golbez as a character: a sense of musical precision and learnedness shapes Golbez as the authoritative mastermind (rather than, say, a chaotic madman). In sum, Golbez is a particular kind of villain as shaped by musical meaning. But Golbez's character blend is purely narrative—

this could have been an analysis of a film character with a similar style of main theme. How, then, do *play* and *game* come into the mix?

In what follows, I take up some examples to describe how play is a mediating process in the formation of conceptual blends. Play, as an act of discovery and of meaning construction, also leads to environmental adaptation. Habituated play is thus a process of *inhabiting* gameworlds as models for meaning. As much as conceptual blending relies on culturally specific cross-domain mapping, we might further consider game environments to constitute their own form of specificity and their own possibilities for these mappings.

Mapping Music and Meaning through Habituated Play: Some Examples

Super Mario World's Perilous Platforms

In chapter 2, I analyzed the Overworld cue from Super Mario World to define affective zones. There, I briefly discussed both looping repetition (the full loops of the cue as well as the internal repeats in the music) and associative repetition (consistently encountering the same music for the same level). I briefly mentioned how, over time played, this music becomes synonymous with playing the level: "♯$\hat{4}$s and ♭$\hat{3}$s" of the eclectic style of the cue as metaphors for the perilous platforms of the level. In other words, the habituated player perceives the cue within the larger interactive ecology of the game that encompasses affordances for interaction. In figure 4.4, I've applied a conceptual blending model to demonstrate how that particular chromaticism,

along with rhythmic syncopation, lend conceptual resources to the player's understanding of the video game level as an interactive space.

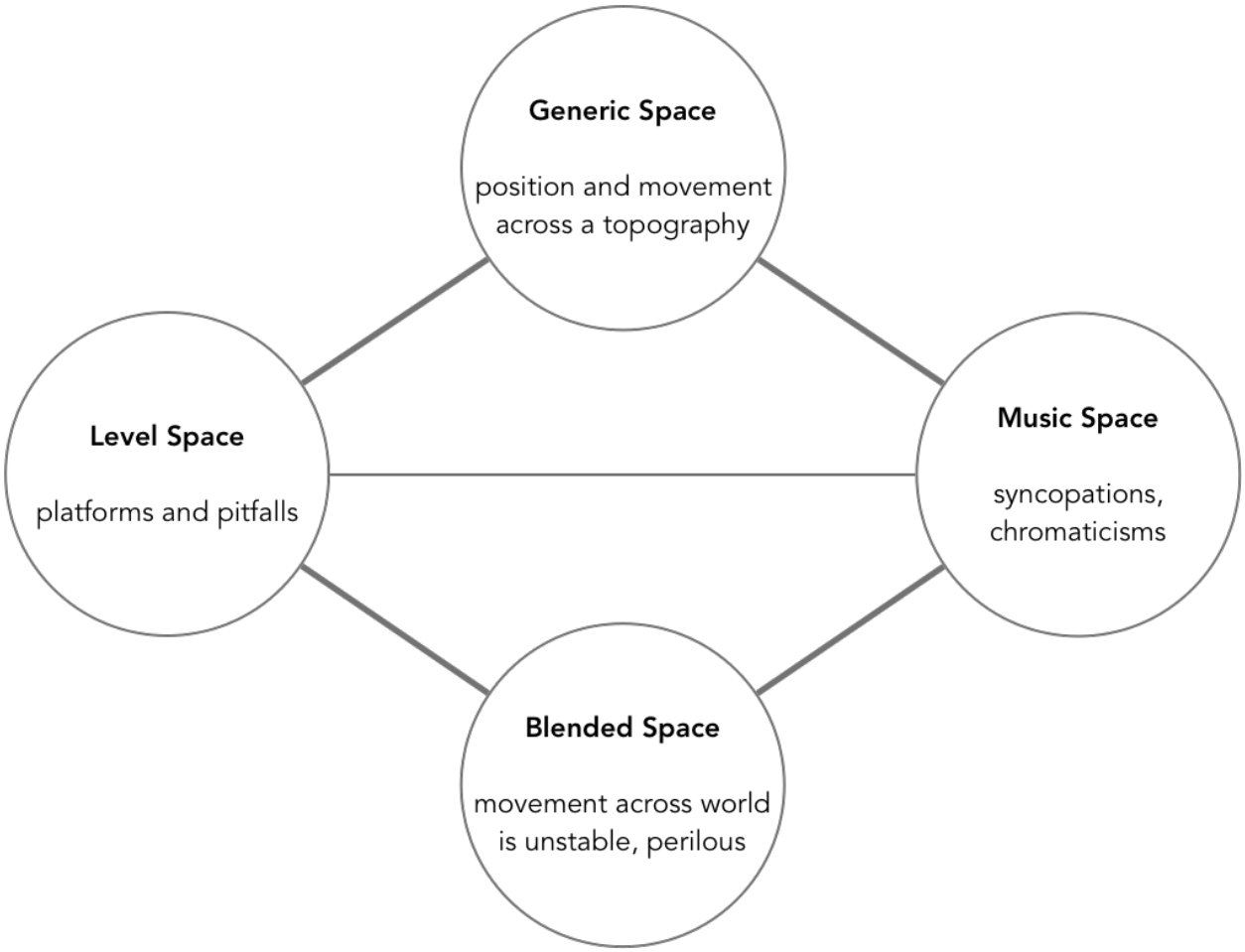


Figure 4.4: Conceptual integration network for the Overworld cue from *Super Mario World*

Mapping both music and matter through a general concept of topographical position and movement, we can analyze how off-beat syncopations and off-key chromaticisms project tonal instability that maps onto the unstable nature of movement in the level. Importantly, part of this

blend encompasses the ludic nature of this concept—that platforms are *perilous,* and one wrong move could result in losing a life in the game. In this way, the danger concept in the Overworld music is different from that of Golbez's music—the former being a matter of ludic success and failure, the latter a narrative form of danger enacted upon characters and events in the storyworld. This example offers a way of understanding musical meaning for the player, and potentially the composer as well—Koji Kondo has stated that he wrote these level themes with a sense for matching the athletic feats of Mario.[38]

Tetris and "Affording" Indeterminacy

Recall how Michiel Kamp's analysis of the music of *Tetris,* in its never-ending loops, was said to afford indeterminacy regarding the sensation of time. Rather than considering this music in terms of its *own* interactive affordances (and indeterminacy here seems to characterize more of a feeling than anything else), a conceptual blend between the music and the game can describe how this sense of indeterminacy comes about.

In the conceptual integration network mapped in figure 4.5, I've used the simple notion of endless repetition as the mapping scheme between repetitive actions and repetitive music in *Tetris.* In most variations of the game, the music repeats endlessly no matter what—this

[38] About his general compositional process for game music, Kondo stated, "I almost always knew the time in advance, and wrote my songs to that. However, most of the time the songs would just match up naturally in timing. I think it's down to the inherent sense of rhythm that human beings possess. The people who make game trailers certainly have it, as you can see from the way the trailers always have a certain flow and the music ends precisely on time." From an interview with Koji Kondo and Kazumi Totaka, "The History of Nintendo Game Music (1982–2001)," trans. Shmuplations [pseud.], *Nintendo Online Monthly* (2001), http://shmuplations.com/nintendogamemusic/.

repetition occurs irrespective of the actual musical materials. And while progressive levels of *Tetris* become more and more difficult, the mechanics of play are also the same, requiring repetitive interactions. I posit that the unchanging nature of repetitious music lends *Tetris* a feeling of indeterminacy in player actions—in other words, no matter what the player does, the situation presented by *Tetris* will not end. This is of course not true (players can and will lose, eventually), but that doesn't preclude a conceptual blend that imbues play with a sense of indeterminacy and even helplessness as the music persists.

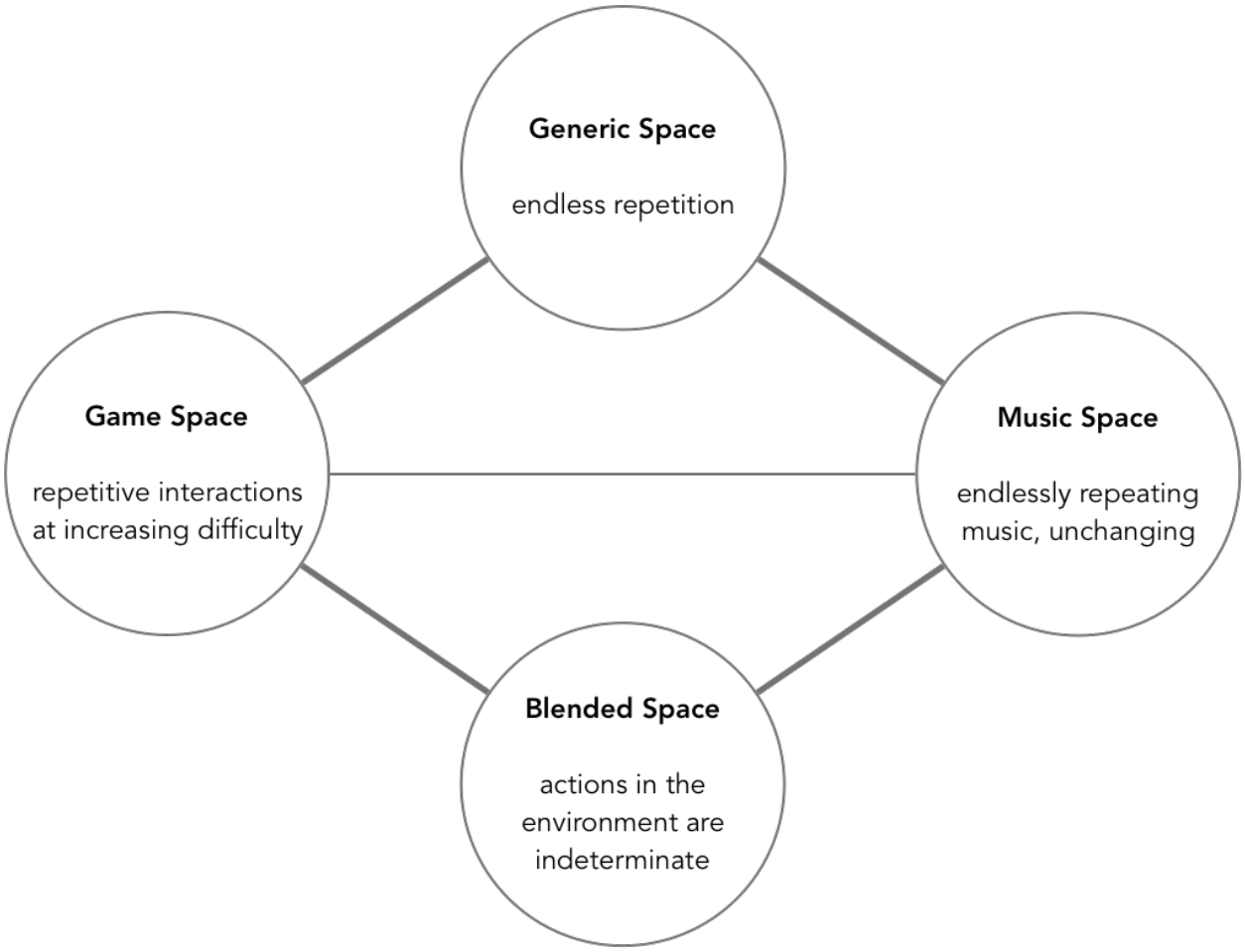


Figure 4.5: Conceptual integration network for *Tetris*

This blend is purposefully vague with what constitutes the music space, as Michiel Kamp's original analysis refers to the many versions of *Tetris* that have musical choice. These could be something from Tchaikovsky's *Nutcracker*, a Bach minuet, Russian folk songs, or original compositions—all of which repeat endlessly over play. It should be noted that different musical choices could offer different blends, as the theory is not meant to be exhaustive of musical meaning.

Balancing Safety and Danger in *Bejeweled 3*

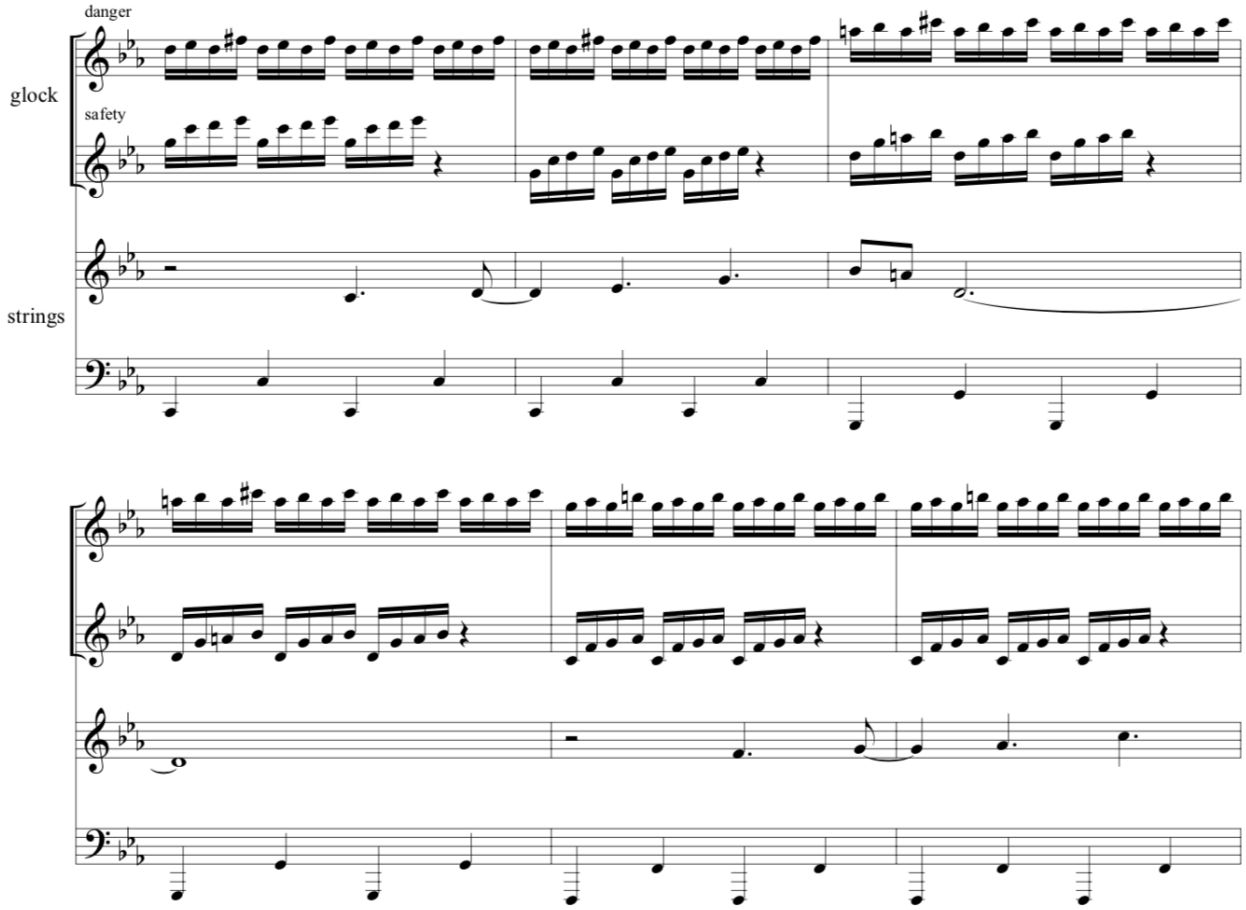
Finally, I return to *Bejeweled 3*. The game features an "Ice Storm" mode of play (figure 4.6), in which rising ice columns will "freeze" the screen a few moments after they reach the top, resulting in a game-over. The rise of the ice columns can be thwarted by matches within the column's vertical purview; horizontal matches stop their rise momentarily; vertical ones break the columns altogether. The longer the player is able to keep the board unfrozen, the more points he gains. But the columns also rise faster, making speed and a good eye for vertical matches increasingly important.

Figure 4.6: Ice Storm mode in *Bejeweled 3*

It might seem most relevant to see where columns are rising and find matches that correlate with columns, but players familiar with the game will learn that it is actually faster to

simply make as many matches as quickly as possible, particularly in later stages when the entire screen is filled with quickly rising columns. Because the player's eyes must be quickly scanning the board for matches, it is easy for some of the more urgent columns to rise unnoticed until a sound effect triggers, indicating that the freezing is about to occur (this sonic cue, a kind of auditory shivering, gives the player about five seconds to break the column).

Players familiar with the game, however, learn to rely not on this sound effect but on a more a subtle change within the background music prior to this five-second warning. The music features a synthesized glockenspiel twinkling above the melody—when this twinkling shifts from a pattern that is largely *consonant* with the rest of the music to one that is largely *dissonant*, players are in the danger zone. The glockenspiel change is then followed by dissonant bass notes, but I focus on the glockenspiel because its change is earlier and more salient. Example 4.1 shows a reduction of a few measures of music, with the top two staves showing the dissonant and consonant glockenspiel lines, respectively.



Example 4.1: A few measures of a reduction of the music for Ice Storm mode from *Bejeweled 3*. The top line is the dissonant glockenspiel line, which will replace the consonant glockenspiel line below it in times of danger.

Overall, the Ice Mode cue circles around C minor and C Dorian, with brief forays into relative E♭ major—nothing too wild. As long as the player is not in danger of losing, all of the music material follows the bass's chugging along on a predictable, repeated harmonic progression. So, when the glockenspiel starts to sound its tritonal dissonances—F♯ against C, C♯

against G, and so on—it is a change noticeable even as the standard sound effects of play dominate the auditory foreground.

Let's first consider this *pre*-habituation when the player is encountering these materials for the first or second time. We *might* say that this musical change sets up two affective zones, in which affordances of play are similar but where slight differences in attention and speed might come into play during the musically dissonant moments. Similar to *Super Mario World*, the dissonant crystalline sound alerts the player to an imminent *time is running out*. He then directs his attention to the offending ice column. I would argue, however, that the nature of the speed required and short time in which the "danger" music is playing, along with a necessarily high focus on the visual elements of the game, might foreclose any possibility of the player even really noticing the sound very much in that case. Moreover, the sound only plays for a brief moment before game-over. It is only at the level of habituated play that this aspect of the music emerges as particularly meaningful, an aural perceptual honing that maps onto the task at hand.

In this case, we can say that the change in the glockenspiel from consonant to dissonant already carries with it meaning that can be mapped to play—sudden musical dissonance is a kind of conflict, a disturbance in what is expected. (Further, the glockenspiel itself is a high-pitched percussive sound to which listeners often ascribe cold textural adjectives, so it already represents a conceptual blend of sorts.)[39] The binary of positive vs. negative maps game state to musical

[39] In a study of cross-modal metaphorical descriptions of instrument timbre, Zohar Eitan and Inbar Rothschild found that participants tended to rate higher pitches and lack of vibrato on the cold end of a hot-cold scale. See Eitan and Rothschild, "How music touches: Musical parameters and listeners' audio-tactile metaphorical mappings," *Psychology of Music* 39, no. 4 (2011): 449–467.

state, creating a blend that relates consonance and dissonance to play. Figure 4.7 shows a conceptual integration network for this blend.

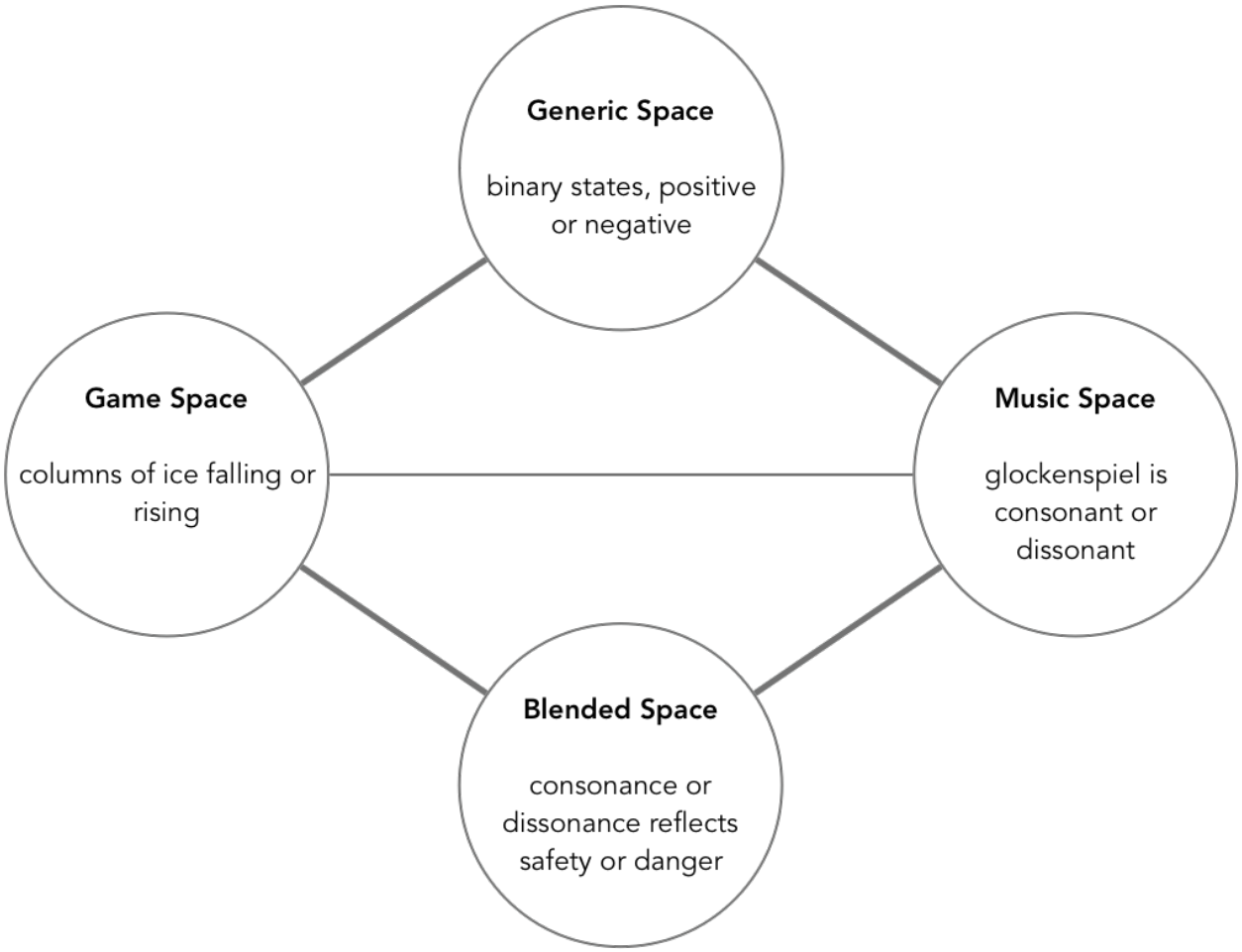


Figure 4.7: Conceptual integration network for Ice Storm mode in *Bejeweled 3*

This blend demonstrates how play can help map musical and ludic concepts: the state of the glockenspiel's consonance is blended with game rules, allowing players to conceptualize game state as a matter of some sense of harmoniousness. Further, we might think of play as helping

solidify some deeply rooted concepts of musical consonance and dissonance—if dissonance is used as a metaphor for conflict. Playing *Bejeweled 3* adds another facet to such meaning.

Musical Adaptation Beyond Video Games

With a basis for understanding emergent conceptual blends through music in video games, this chapter concludes with some thoughts as to how habituated play might help redefine music meaning *beyond* games. I introduced this chapter not with an example from video games, but one from real life—the process of honing perceptions through the banal task of pepper sorting. I noted that such a repetitive task led to dreaming of peppers when I closed my eyes to sleep—a kind of pervasive "after-image." What *also* happens, when one spends a few hours looking for a spot of red in a sea of green, is that such affordances become generalized in the environment: I was spotting red *everywhere*—not just on the conveyor belt, not just when I closed my eyes, but in my regular day-to-day tasks.

This effect, in which repetitive actions begin to shape perceptions even beyond the context of that action, was termed the *Tetris Effect* (sometimes even pathologically framed as the *Tetris Syndrome*) by Jeffrey Goldsmith in 1994.[40] Extended time playing video games can have an effect on cognition and perception, producing a kind of extended after-image of the game-world's features and affordances. (This phenomenon of hallucinations is not limited to visual

[40] Jeffrey Goldsmith, "This Is Your Brain on Tetris," *Wired,* May 1, 1994, https://www.wired.com/1994/05/tetris-2/. This is not to be confused with the 2018 game *Tetris Effect,* a virtual reality game which was named after this phenomenon and seeks to capture an aspect of it by removing the boundary of the screen and placing you within the "world" of *Tetris*.

perception, but it is most often studied in that modality.)[41] Binge-players of *Tetris,* for example, might notice that they seem to "see" falling blocks whenever they close their eyes. More intriguingly, they might also conceive of their real world in terms of objects fitting snug amongst one another—the main objective and environmental affordance of the *Tetris* environment.

Psychologist Vladimir Pokhilko, in describing the Tetris Effect in *Tetris*, characterizes the mechanism for the phenomenon:

> The main part is visual insight. You make your visual decision and it happens almost immediately. … The second mechanism is unfinished action. *Tetris* has many unfinished actions (that) force you to continue and make it very addictive. The third is automatization: In a couple of hours, the activity becomes automatic, a habit, a motivation to repeat.[42]

Decision, addiction, and habit. For years, these features of video games have been used as evidence against their worth as an activity, particularly for children. Instead of falling into that discourse (another verticality metaphor for you), I simply consider these phenomena as particular aspects of play that can shape our experience of music. Is there a kind of Tetris Effect for musical cognition? Does hearing these looping tunes over and over again, becoming

[41] For example, Deniz Peters studied how dancers who were directed to improvise with a virtual spatial musical instrument began to perceive a tactility in sound. See "Haptic Illusions and Imagined Agency: Felt Resistance in Sonic Experience," *Contemporary Music Review* 32, no. 2–3 (2013): 151–164.
[42] Goldsmith, "This Is Your Brain on Tetris," https://www.wired.com/1994/05/tetris-2/.

habituated to sound as much as we are to site, influence the way we perceive of other kinds of music?[43]

Angelica B. Ortiz de Gortari and Mark D. Griffiths have studied this effect in other modalities, describing what they call "Game Transfer Phenomena," or GTP. GTP encompasses "a variety of non-volitional phenomena related to playing videogames including thoughts, urges, images, and sounds when not playing."[44] In their study, 73.9% of participants "heard" a game's music after playing a game, 65.3% misinterpreted a sound in real life as something from a video game, 64.6% "heard" a sound from a video game when not playing, and 45.6% "heard" a character's voice from a video game when not playing. In total, 85.2% of participants (n = 2362) experienced altered auditory perceptions after playing a video game.[45]

It is not clear how often such an effect will last for any given person, and I suspect there are many factors that influence how long these auditory after-images might persist. Nonetheless, I posit that the more a player plays a game, adapts to its novel environment, and comes to know the game as an interactive ecology constituted by music, the more likely such an experience will alter how that player encounters music in the "real world." Might a heavy player of *Bejeweled* 3's Ice Storm mode come to perceive dissonance in music, particularly as produced by glockenspiel-

[43] For whatever it's worth, I can personally attest to "hearing" video game sounds and music after having binge-played a video game. My most recent experience is hearing part of a cue from *The Legend of Zelda: Breath of the Wild* in the "dings" of the CTA train doors. This sensation disappeared after I had stopped playing the game for a few weeks.
[44] Angelica B. Ortiz de Gortari and Mark D. Griffiths, "Prevalence and Characteristics of Game Transfer Phenomena: A Descriptive Survey Study," *International Journal Of Human-Computer Interaction* 32, no. 6 (2016), 1.
[45] Ortiz de Gortari and Griffiths, "Prevalence and Characteristics of Game Transfer Phenomena," 475.

like sounds, to indicate danger? How might *Super Mario World*'s syncopated, jazz-like tunes evoke particularly fraught movement through musical space? Do *Tetris*'s musical loops evoke a feeling of indeterminacy and increasing anxiety when hearing other repetitive music?

Perhaps Michiel Kamp's statement that gameplay might shape the affordances of music, not simply the reverse, is apt. After all, if we come to video games with a perspective that is adapted to a "real world" of musical meanings, it stands to reason that novel "ludomusical" concepts might follow us out of those virtual spaces.

Epilogue
Playful Music: Extending the Magic Circle

In this dissertation, I've explored how music shapes meaning in video games through several analytical lenses that place priority on interaction and play. In chapter 1, I described how the magic circles of games contextualize meaning and offer possibilities for musical shaping and reshaping of those meanings. In chapter 2, I argued that music creates *affective zones* that circumscribe new spaces of feeling and perception. Chapter 3 offered a way to consider formal structures of games through the procedures of music through a *ludomusical narrativity*. And in chapter 4, I contended that music can be considered part and parcel of interactive ecologies through *habituated play.* In each case, I've offered an avenue toward understanding meaning in games through music. But I began this dissertation not with a discussion of musical meaning in video games, but rather its persisting value to players. So, I'll conclude by looping (appropriately) back to the beginning, returning to those controversial ClassicFM rankings. How do we go from what makes musical *meaning* to what makes music *meaningful?*

Perhaps we might consider the ways in which video game music extends beyond magic circles. For instance, in 2017, the *Distant Worlds* concert tour began its tenth run worldwide, featuring music from Square Enix's series *Final Fantasy* on its 30th anniversary. Performing symphonic arrangements of beloved tunes alongside projected gameplay, the *Distant Worlds* concert series is part of a growing phenomenon of video game concerts following in the "pops"

tradition of non-classical music on the classical stage—a juxtaposition similar to ClassicFM's rankings. These concerts often sell out to capacity, filling the halls with a crowd younger than the usual patrons of Mozart and Mahler, and providing an easy financial boon to always-struggling symphony orchestras. Meanwhile, on a much smaller stage in trendy "barcades" across the country, those same video game tunes can be heard being performed by amateur musicians who arrange this music themselves. But the crowd here is much the same—adults who played these games as kids and teens, who remember getting to that final boss 20+ years ago, playing along with the music. In whatever form, video game music is inscribed with the experience of millions who've played these games. This dissertation demonstrates how that "inscription" might occur: the processes of play enliven and activate music, which becomes a salient marker of meaningful experiences.

And it is through play that music develops the kinds of values that listeners might otherwise only associate with art music. We might describe our favorite piece of classical music as stirring emotions, feelings of the sublime, being particularly evocative or compositionally complex—all of which are descriptions we might not typically apply to a thirty-second 16-bit tune, for instance. But the exchange between music and play in video games, each shaping the other, is what imbues music with feelings, associations, and a sense of complexity. It is this richness of musically mediated play, and playfully mediated music, that can draws thousands to online advocacy.

Eimear Noone, one of the conductors of the concert series *The Legend of Zelda: Symphony of the Goddesses,* explained this phenomenon in simple terms: "When you're playing a game, you are living that music every day, and it just gets into your DNA. … When people hear those themes, they are right back there. And people get really emotional about it. I mean REALLY emotional. It's incredible."[1]

As much as we could consider video games as a new medium of expression, for game designers to tell stories in interesting and novel ways, what is more interesting to me are the stories that players create themselves through gameplay experiences. And these experiences of play are musical, embodied in a way that seems almost metaphysical in its capacity to transport players "right back there." In a way, music extends the magic circles to bring the meanings and experiences of gameplay to bear outside of games in shaping not just play, but also the *people* playing. In transcending the bounds of magic circles, music is a realization of the possibilities of play, and the potential for virtual meanings to be as real as real life.

[1] John Leicester, "From bleeps of 'Pong' and 'Mario,' game music comes of age," *AP News,* June 18, 2017, https://www.apnews.com/f2f89b61425a4afa931f0b2a8b5ab58e.

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List of Games

The following is a list of all games mentioned in this dissertation. The information provided here follows this format: Title (Developer, Year of release). Platform [where relevant]. Composer.

American McGee's Alice (Rogue Entertainment, 2000). Music by Chris Vrenna.

Audiosurf (Invisible Handlebar, 2008). Music by Pedro Camacho.

Banjo-Kazooie (Rare, 1998). Nintendo 64. Music by Grant Kirkhope.

Bejeweled 3 (PopCap Games, 2010). PC. Music by Peter Hajba and Alexander Brandon.

Bioshock Infinite (Irrational Games, 2013). Music by Garry Schyman.

Celeste (Matt Makes Games, 2018). Music by Lena Raine.

Chime (Zoë Mode/OneBigGame, 2010). Music by Nathan McCree.

Civilization series. (MicroProse/Activision/Firaxis, 1991–2019).

Dear Esther (The Chinese Room, 2012). PC. Music by Jessica Curry.

Donkey Kong 64 (Rare, 1999). Nintendo 64. Music by Grant Kirkhope.

Dys4ia (Anna Anthropy, 2012). Web browser. Music by Liz Ryerson.

Everybody's Gone to Rapture (The ChineseRoom/SCE Santa Monica Studio, 2015). Sony PlayStation 4. Music by Jessica Curry.

Final Fantasy III (Square, 1990). Nintendo Famicom.
(Square Enix, 2011). Nintendo DS.
Music by Nobuo Uematsu.

Final Fantasy IV (Square, 1991). Released as *Final Fantasy II* in North America. Super Nintendo Entertainment System; PC emulator. Music by Nobuo Uematsu.

Final Fantasy VI (Square, 1994). Released as *Final Fantasy III* in North America. Super Nintendo Entertainment System. Music by Nobuo Uematsu.

Final Fantasy VII (Square, 1997). Sony PlayStation. Music by Nobuo Uematsu.

Final Fantasy XV (Square Enix, 2016). Sony PlayStation 4. Music by Yoko Shimomura.

Flower (thatgamecompany, 2009). Music by Vincent Diamante.

Gone Home (The Fullbright Company, 2013). PC. Music by Chris Remo.

Grand Theft Auto series (Rockstar Games, 1997–2015)

Guitar Hero (Harmonix, 2005).

Journey (thatgamecompany, 2012). Sony PlayStation 3. Music by Austin Wintory.

Just Dance series (Ubisoft, 2009–2019).

Katamari Damacy (Namco, 2004). Music by Yuu Miyake, Asuka Sakai, Akitaka Tohyama, Hideki Tobeta, Yoshihito Yano, and Yuri Misumi.

The Legend of Zelda (Nintendo, 1986). Nintendo Entertainment System; Wii Virtual Console. Music by Koji Kondo.

The Legend of Zelda: Breath of the Wild (Nintendo, 2017). Nintendo Switch. Music by Manaka Kataoka, Yasuaki Iwata, and Hajime Wakai.

The Legend of Zelda: A Link to the Past (Nintendo, 1991). Super Nintendo Entertainment System. Music by Koji Kondo.

The Legend of Zelda: Ocarina of Time (Nintendo, 1998). Nintendo 64. Music by Koji Kondo.

The Legend of Zelda: The Wind Waker (Nintendo, 2002). Music by Kenta Nagata, Hajime Wakai, Toru Minegishi, and Koji Kondo.

Mario Kart 64 (Nintendo, 1996). Music by Kenta Nagata.

Minecraft (Mojang, 2011). Music by C418.

Minecraft: Story Mode (Mojang/Telltale Games, 2015). Music by Anadel, Antimo, and Welles.

Monopoly. (Parker Brothers/Hasbro, 1935).

Monster Hunter World (Capcom, 2018). Music by Akihito Narita and Zhenlan Kang.

Myst (Cyan, 1993). Music by Robyn Miller.

No Man's Sky (Hello Games, 2016). Music by 65daysofstatic.

Pac-Man (Namco, 1980). Music by Shigeichi Ishimura and Toshio Kai.

Pong (Atari, 1972).

Professor Layton series (Level-5, 2007–2017). Music by Tomohito Nishiura.

Proteus (Ed Key and David Kanaga, 2013). Music by David Kanaga.

Red Dead Redemption 2 (Rockstar Games, 2018). Music by Woody Jackson.

Rhythm Heaven (Nintendo, 2008). Music by Tsunku and Masami Yone.

Rock Band series. (Harmonix, 2007–2017).

Rogue (A.I. Design/Epyx, 1980).

Second Life (Linden Lab, 2003).

The Sims (Maxis, 2000). Music by Jerry Martin and Marc Russo.

Star Fox (Nintendo, 1993). Music by Hajime Hirasawa.

Star Fox 64 (Nintendo, 1997). Music by Hajime Wakai and Koji Kondo.

Star Wars Battlefront (Electronic Arts, 2015). Music by Gordy Haab.

Super Mario Bros. (Nintendo, 1985). Nintendo Entertainment System. Music by Koji Kondo.

Super Mario World (Nintendo, 1990 (JP), 1991 (NA)). Super Nintendo Entertainment System. Music by Koji Kondo.

Thoughts & Prayers: The Game (Everyday Arcade, 2016). Web browser. https://www.thoughtsandprayersthegame.com/.

Tetris (Alexey Pajitnov, 1984).
(Nintendo, 1991). Nintendo Gameboy.
(Nintendo, 1993). Nintendo Entertainment System.

Tetris Effect (Monstars Inc./Resonair, 2018). Music by Noboru Mutoh.

Unreal (Epic MegaGames/Digital Extremes, 1998). Music by Alexander Brandon, Michiel van den Bos, Andrew G. Sega, and Dan Gardopée.

World of Warcraft (Blizzard, 2004). Music by Jason Hayes.