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Music in Indie Video Games:

A Composer's Perspective on Musical Approaches and Practices

Tim Harbour

A thesis submitted to the Faculty of Humanities, University of Witwatersrand, Johannesburg, in fulfilment of the requirements for the Degree of Master of Music

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Abstract

In this part-written, part-composed creative research project I consider the music of 'indie' video games, specifically exploring some of the myriad dynamic compositional approaches in this particular category of game development. In my written work I analyse three indie video games – *Braid* (2008), *Fez* (2012) and *Journey* (2012) – each of which use unique methods to apply music dynamically. I use interviews with the games' creators, as well as close analysis and transcription of significant sections of each video game, in order to reveal how music is used to provide the player with a more immersive, satisfying, and involving gaming experience. I also consider the use of ambient music in indie video games, a common feature of a large number of contemporary games, weighing up its merits and limitations. Musical concepts and compositional approaches raised in my written work have informed the portfolio of compositions submitted for this degree, and, similarly, my creative work has informed my analytical research. My creative work explores, amongst other aspects, indeterminate form, ambient music, and ways of 'looping' material in the creation of unrepeatable structures. This thesis also considers music which functions narratively in games – a function that might necessitate a greater degree of musical linearity — and how this musical role might be incompatible with the demands of interactivity.

After briefly introducing the concepts dealt with across this thesis in Chapter 1, Chapters 2 to 4 take the form of case studies of the indie games mentioned above, with each chapter tackling unique challenges that game composers face when writing music for non-linear games, by which I mean games structured so that not all players will experience the content in the same order due to player agency. More specifically, Chapter 2 deals with the game *Braid* and its use of pre-composed, licensed music and how the game's developer applies this music dynamically to the game. Chapter 3 deals with *Fez* and its mainly adaptive musical approach, its built-in software music engine, 'Fezzer', which allows for a composer to input and manipulate musical loops in the game, and nostalgia in indie video game aesthetics. Chapter 4 centres on the video game *Journey* and on how autonomous, 'narrative' music in video games might be seen to exist in opposition to music's ability to be truly dynamic. Finally, Chapter 5 reflects on my own creative work for this thesis; how concepts from the case studies have informed my creative work and vice versa.

Declaration

This research is an original piece of writing and is not plagiarised in any way. Any ideas of authors referred to in this thesis have been referenced and cited in the appropriate manner.

I declare that this dissertation is my own unaided work. It is submitted for the degree of Master of Music at the University of Witwatersrand, Johannesburg. It has not been submitted before for any other degree or examination at any other university.

_____

Timothy James Harbour

16 February 2016

Contents

Acknowledgments v

List of Figures vi

List of Compositions viii

Chapter 1 –Introduction 1

Chapter 2– *Braid*:A Game of Layers 12

Chapter 3– *Fez*: Dynamic Music in Non-Linear Games 33

Chapter 4– *Journey*:Musical Interactivity vs. Musical Autonomy 55

Chapter 5 – Composing Dynamic Music:Reflections on The Production Of My Own Composition Portfolio 80

Chapter 6 – Conclusion 104

Bibliography 110

Appendix A – Author's Transcription of 'Home' 118

Scores – 'Eno The Truth' 121

Scores – 'incommensurable' 123

Scores – 'Spheres' 130

Scores – 'Canvas' 142

Scores– 'Garden' 152

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List of Figures

Fig. 1:	Screenshot from *Braid*: time and forgiveness, book 1	13
Fig. 2:	Screenshot from *Braid*: time and forgiveness, book 2	14
Fig. 3:	Inventory of music in *Braid*	17
Fig. 4:	My aural transcription of 'Maenam' by Jami Sieber	21
Fig. 5:	My aural transcription of a section of 'Tell It by Heart'/'Long Gone Past' bass part by Jami Sieber	22
Fig. 6:	My aural transcription of 'Downstream' by Shira Kammen	28
Fig. 7:	My aural transcription of 'Lullaby Set' by Shira Kammen	29
Fig. 8:	*Fez* from a three-dimensional perspective (screenshot from the game)	37
Fig. 9:	*Fez* at night (screenshot from the game)	39
Fig. 10	Music gameplay in *Fez* (Vreeland 2013)	42
Fig. 11:	*Fez*'s music system for a single piece of music (Vreeland 2013)	45
Fig. 12:	Basic author's transcription of introduction motif from 'Memory' and 'Majesty'	52
Fig. 13:	Inventory of *Journey*'s musical resources	61
Fig. 14:	Author's transcription of the theme from *Journey*	63
Fig. 15:	Wintory's illustration of interactive music in *Journey* (Wintory 2012)	67
Fig. 16:	Author's transcription of the melody of 'Threshold'	71
Fig. 17:	Author's Transcription of the Introduction of 'Apotheosis'	77
Fig. 18:	'Eno the Truth' left hand intervals	82
Fig. 19:	'Eno the Truth' Section C	83
Fig. 20:	'incommensurable' part 2	84
Fig. 21:	'incommensurable' part 3	85
Fig. 22:	'incommensurable' part a	85
Fig. 23:	Section 1A from Sphere 1	87
Fig. 24:	Section 2A from Sphere 2	87
Fig. 25:	Section 3A from Sphere 3	87

Fig. 26: Chords for ‘Wash’ 92
Fig. 27: Chords for ‘Blind’ 93
Fig. 28: Guitar melody from ‘Blind’ 94
Fig. 29: ‘Garden’: percussion part 1 95
Fig. 30: ‘Garden’ section 1 97
Fig. 31: ‘Garden’ section 2 98
Fig. 32: ‘Garden’ section 3 99

List of Compositions (refer to Chapter 5)

1: Eno the Truth

2: incommensurable

3: Spheres

4: Rescoring Two Sections of *Journey*

5: Canvas

6: Cluster Suite

- 6.1: Wash
- 6.2: Blind

7: Garden

8: Music for five short games

- 8.1: Dead Run
- 8.2: Beat Attack
- 8.3: Sweet Dreams Bobby
- 8.4: Mecha Cop 2875
- 8.5: Harmony Bloom

Chapter 1

Introduction

1.1 Background and rationale

The study of music's place and function in moving image media has traditionally been focused on film. Although there has been a surge of scholarly and popular writing about video game music in the last fifteen to twenty years, it has only been in the last ten years or so that there have been significant advancements in the theorisation of video games' specific musical needs and functions, as well as in the literature that considers the practical application of skills and techniques required to produce video game music.

At the outset it is worth stating the obvious: what distinguishes video games from most other kinds of screen-based media (like film and television, for example), is interactivity. A game in which a player interacts dynamically with all aspects of the experience – image, sound, gameplay, in short the 'world' of the game – leads to a greater degree of immersion and a more satisfying gaming experience. This clearly has implications for music, and not least for composers: how do you score a sequence in a game in which the direction and timings a player takes are unpredictable? How do you score an exploratory section of a game without the music becoming boringly repetitive? How do you adapt music's inherent linearity to dynamic and interactive contexts? Understanding sound and music's role in such nonlinear contexts thus clearly requires a specific approach.

In 2002, one of the first important game audio scholars, Eric Pidkameny, stressed the importance of musical interactivity in video games and of video game music as a significant area of research that required scholarly attention, stating that it was his:

> intention to prove first that there exists game music with considerable beauty and art, and second that game music, as a feature of video and computer games, allows for a level of interactivity with its listeners that no other genre of music can match, wherein the gameplayer himself is involved in the process of composition. (2002)

In the same year, David Bessel published a paper, 'What's That Funny Noise: An Examination of the Role of Music in *Cool Boarders 2*, *Alien Trilogy* and *Medievil 2*'(2002), in which he examined music's role, function and relationship with gameplay in three specific video games. Later, in 2007, Rod Munday noted that due to a lack of critical theory in video game music composition, "more research needs to be undertaken in order to understand how players are using music in video games" (2007, 64).

Karen Collins took on Munday's challenge and began seriously theorising this area in her monograph, *Game Sound* (2008). Collins makes use of the terms *interactive* and *adaptive* sound, to define two types of audio found in video game music. Collins argues that "interactive audio[…] refers to those sound events that react to the player's direct input"; for example, sound effects that are produced when a player performs in-game actions such as jumping or running (4). Adaptive audio, on the other hand, refers to "sound that reacts to the game states, responding to various in-game parameters such as time-ins, time-outs, player health, enemy health, and soon" (Ibid). Another example of adaptive audio is music that changes in mood according to what time of day it is in a video game (Ibid). Collins categorises both these types of audio as "dynamic", and asserts that the term "dynamic audio […]encompass[es] both interactive and adaptive audio", and that "dynamic audio reacts both to changes in the gameplay environment, and/or to actions taken by the player" (Ibid).

Collins argues, "dynamic music is becoming more of a requirement for games as production values increase and players tire of the typical looping playback model" (2008, 139). In the years since Collins wrote this, with advancements in gaming hardware and software, the need for sophisticated dynamic and adaptive solutions to the challenges of interactive audio have, if anything, become even greater.

In recent years, video game composer-centered guides have emerged. Some examples of these include Michael Sweet's *Writing Interactive Music for Video Games: A Composer's Guide*(2014), which focuses on compositional techniques for writing interactive music, and *Music In Video Games: Studying Play* (2014)edited by K.J. Donnely, William Gibbons and Neil Lerner, which

includes chapters that instruct would-be video game composers, and explores video game music history, style and conventions.

In another recently published composer-centric guide, Winifred Phillips' *A Composer's Guide to Game Music* (2014), Phillips helpfully identifies two primary compositional strategies for creating dynamic audio in games: horizontal re-sequencing and vertical layering (Phillips 2014). Horizontal re-sequencing refers to a method whereby pre-composed and pre-realised segments of audio are "juggled and recombined" in ways that are determined by gameplay (193). A vertical layering or re-orchestration model also attempts "to give music the ability to change and react to the conditions of gameplay" but does this by simultaneously stacking musical components (Ibid). Both approaches to composition are ones adopted by the composers of the case studies I discuss in this thesis, as well as in my own creative work.

If most game music literature has sought to show how music functions in interactive contexts or instructs would-be video game composers in how to make interactive music, a notable but somewhat dissenting voice in recent years is Andrew Smith, who argues that music's inherent linearity precludes most game music from being truly interactive.

In his Master's thesis, *The Myth of Interactive Audio: Game Sound Dichotomies and Implementation Strategies* (2014), Smith argues that until music in games can be fully procedural, that is, music as process, as code, as potential sound rather than realised audio data, current models of working with "temporally resistant" samples of audio – either horizontally or vertically – cannot be regarded as fully interactive (2). Smith's research "[surveys] the numerous advantages of sound in games, but also highlights the fundamental intractability of implementing credible soundscapes in interactive contexts", and he contends that often "game audio strategies are little more than cunning attempts at bludgeoning temporally resistant audio files into interactive contexts" (Ibid). While Smith's argument is persuasive, I seek to show how the indie video games that make up my case studies in this thesis have developed unusual and imaginative approaches to creating high levels of dynamic interaction between player and music in a game, while working largely with *realised* audio. My

written thesis reveals and explores how three recent indie games have devised unique solutions to the apparently intractable dilemma Smith raises.

1.2 Towards a definition of 'indie' games

Indie or independent games, generally speaking, are games produced by individuals or small teams without the backing of – or, crucially, creative interference from – a major video game publisher. In contrast to the far better resourced and larger teams that develop so called 'AAA' ('triple A') games, indie games often have fewer creative limitations and in some cases, perhaps due to financial imperatives (less time and fewer people), have had to find innovative solutions to creative challenges, not least those of interactive music and sound. It is for this reason that I have chosen these kinds of games for this study.

That being said, 'indie' can be considered a fairly loose term owing to the fact that many indie companies have varying budgets and team sizes, as well as business models and approaches to game design. Nadav Lipkins states that "there is significant confusion over what defines 'mainstream' or AAA game development, though arguably not quite as much as is the case for indie gaming", and goes on to argue that the line drawn between indie and AAA games can be somewhat indistinct, especially in a modern techno-economic market where AAA companies have co-opted certain aesthetics of indie games (2013, 9).

While 'indie' might be regarded as a fairly loose term, it is still a productive category for this project. Three years ago, when I began surveying the field for this degree, indie game-centered studies were almost non-existent, with one of the few studies being Mark Deuze and Chase Martin's 'The Independent Production of Culture: A Digital Games Case Study'(2009). Very recently papers such as Michael D'Errico's 'Worlds of Sound: Indie Games, Proceduralism and the Aesthetics of Emergence' (2015) and Lipkins' 'Independence: The Meaning of "Indie" Games, the Politics of Production, and Mainstream Co-optation'(2013) have emerged. Deuze and Martin have a more concise if broad description of 'indie', as a primarily *oppositional* game development culture:

> The term 'independent' is used in a number of ways to describe a type of development next to, or juxtaposed with, the mainstream process of creating, marketing, distributing, and playing digital games. (2009, 276)

This definition of the term makes a good fit for indie content developed in any field of media (music, film, etc.), but in terms of video games, the pair admit that their "study also finds that a logic of opposition between mainstream and alternative in gamework is slightly deceptive" (2009, 290). For Deuze and Martin:

> Despite a wide-ranging discourse of what independent actually means, a single unifying thread that is recognized throughout the industry is that an indie game cannot be created under the creative or financial control of [an] external entit[y]. (2009, 277-278)

Yet, a game like *Journey* (2012), one of the case studies considered in this thesis, is consistently regarded by commentators and gaming awards ceremonies as 'indie', was funded by the multinational conglomerate, Sony. That game's creator, Jenova Chen, has said that despite the backing of a large multinational corporation, he had complete artistic freedom to realise his vision:

> When we switched to a venture capital [model of funding], we raised the money because we pitched the project; we sold them on the vision. They believe it, they want to support us to make that happen. So, creatively I've never gotten any input from the venture capital [funders]. It's actually very similar, we are always ourselves, and no one is really messing around with us. With Sony, it was the same thing. (Hillier 2013)

Despite a lack of clarity on whether external funding defines whether a game is indie or not, there are aspects of aesthetics, gameplay, particular kinds of innovation, and a separation from the mainstream that could generally be regarded as common indie game traits. For D'Errico, the most important factor is the:

> 'do-it-yourself' attitude of indie game design and development. This aesthetic embraces limited resources to do seemingly unlimited things, such as create and display vast 3D environments using finite computer processing power, or construct complex systems based on a single rule or game mechanic. (D'Errico 2015, 6)

For Andy Schatz, the developer of indie game *Monaco* (2014), a "good indie [game] [is] never built for a demographic: they [are] built with the passion of the developer" (Schatz quoted in Lipkins 2008, 19). Schatz's vision of indie game culture might be regarded as somewhat rose-tinted– one would assume most game designers have an audience in mind to at least some

extent – but it would not be overreaching to argue that generally lower budgets mean generally less pressure on game designers to appeal to mass global audiences to recoup costs, and therefore have more potential to adopt idiosyncratic approaches to game design.

Another important factor in the rise of indie gaming as an emerging market is the influence of technology. Deuze and Martin argue:

> One of the most important aspects of technology in independent game development is the role that network technologies and digital distribution have in allowing for a diversity of content to reach the market. For independent developers, the internet allows direct access to consumers without the investment required for a physical distribution channel (such as retail space). Digital distribution has a significant influence in shaping the structure and identity of indie game development. As digital distribution primarily caters to niche markets, the file sizes of games must be reduced to maintain accessibility when downloading the game. This, for example, has implications for the level of realistic graphics in a game—a dominant frame in how developers and gamers interpret technological advances in hardware and software. (Deuze and Martin 2013, 280)

This quote is important in showing how the popularity and distribution of indie games has grown due to technological advancements such as widespread access to the internet.

In my experience, a defining feature of most indie games is that they will focus on one main gameplay mechanic, with the entire game revolving largely around that mechanic. For example, in *Braid* (2008), manipulating the flow of time is the main mechanic used for completing puzzles; in each of the game's worlds, the player has the ability to affect the way time behaves in different ways, and, as I demonstrate in Chapter 2, the gameplay mechanic is closely connected with how musical time is treated. In the case of a more popular AAA game such as *Grand Theft Auto IV*(2008), the game involves endless gameplay mechanics and activities, varying from driving and shooting to sports, and so on. Games such as those in the *Grand Theft Auto* series are also often fleshed out with filler content, such as "collect X video tapes", where various objects (such as video tapes) are littered around the game world that can be collected for a reward but have no impact on the game's main narrative beyond extending gameplay. Indie games tend to retain a focus on the main game mechanic, and due to this are generally much shorter (take less time to complete) than AAA games.

To summarise, the term indie game does not allude to the genre of a game but refers to the methods of production as well as a philosophical approach to game design. Technological innovations in the marketing and distribution of indie games should not be overlooked in the rise in popularity of indie games over the last ten years. This conception of indie games will inform the analysis of my case studies in the following chapters.

My exploration of music and indie game aesthetics, including a discussion of 8-bit music and graphics, is revisited in the chapters that follow.

1.3 My interest

My interest in this study comes directly from my life as a gamer and participant in game culture, at the heart of which are indie games. I played my first computer game and learnt to use MS-DOS when I was three years old and since then gaming has been a growing obsession. As a composer for indie games, I have been involved in regular community meet-ups, including composing music for 48-hour game development competitions and collaborating with Game Design students in the Wits School of Arts. I have also been and continue to be involved in creating sound effects and music for commercial video games.[1] The theoretical and analytical ideas investigated in this thesis come directly out of my engagement with indie games both as a gamer and a composer, and my analytical work has fed-back into my work as a composer.

1.4 Objectives of this thesis

This study seeks to explore, using written and composed texts, various ways indie games approach the challenges of interactive music. In my written thesis, I use three case studies, namely the games *Fez, Braid* and *Journey*, to investigate aspects of sound and music in indie video games. I have selected these games for analysis because each game uniquely addresses the challenges that game music composers face today. This study is also practice-based: it

[1] Commercial games I have designed sound and music for include *Pixel Boy and The Ever Expanding Dungeon* (2014) (sound effects), *Blazing Aces* (2014) (music) and *Dead Run* (2014) (music). I also created music and sound effects for *Oliver* (2014) and music for *A Day in The Woods* (2015). During the period of study I also took part in multiple game development competitions, namely the Ludum Dare and Global Game Jam competitions.

includes my own musical compositions that attempt to address some of the specific challenges of composing music for indie video games, as well as a written reflection (Chapter 5) on my creative work. With these compositions I explore ideas such as musical ambience, the use of chromaticism, modular design, and the removal of rhythm and/or pulse from music in an attempt to find new ways of writing fully interactive music for video games. A list of compositions submitted as part of this thesis can be found on page viii of this thesis with the relevant scores and audiovisual files found on the accompanying flash drive.

This thesis does not assume to be a definitive statement on music in indie games, even if it were possible to make such a statement, but rather begins to explore ways in which some indie games, and my own composition for indie games, seek out new ways of using music in games.

1.5 Other important theoretical touchstones and defining terms

1.5.1 Game mechanics/genre

To better understand indie games' often unique and innovative approach to interactive game music, it is important to understand the idea of game mechanics and how it applies to both AAA and indie games. A game mechanic can be described as a basic action or challenge a player has to master or meet in order to complete a game. An example of a common game mechanic is seen in 'first-person shooter' games where the player runs, jumps and shoots from a first-person perspective to defeat enemies, complete puzzles, and perform feats of acrobatics. Many AAA games feature this game mechanic and occasionally may include other unique actions such as casting spells or using special abilities. The main mechanic the player is required to master, however, is that of running, jumping and shooting (https://www.techopedia.com/definition/241/first-person-shooter-fps).

Rather than categorised according to types of narrative or a visual style, games tend to be classed according to game genres based on game mechanics, such as *puzzle/platformer* games in which one uses a timing and jumping mechanic to complete puzzles in a two- or three-dimensional world littered with platforms (Apperly 2006, 6-8). Indie games, however, will generally add a unique element to the genre that defines the game. For example, in the world

of *Fez*, the player controls a character called Gomez in a two-dimensional world. The beginning of the game follows the traditional format of jumping from ledge to ledge until the gamer reaches the top of a building. Upon reaching the top, the player learns the world is actually three-dimensional but can only be viewed from one side at a time, causing one to have to rotate the world in order to complete puzzles and reach previously inaccessible areas. It is clear that the latter example employs a much more original use of a traditional format of video games. It might be argued that because indie games generally lack a publisher, the developers are allowed greater imaginative freedom to depart from or expand traditional gaming formats. This creative freedom might also allow for more interesting or unusual ways to approach a game's sound and music design, another research question this thesis explores.

In Michael D'Errico's recent study he argues indie games set their focus primarily on "game mechanics in contrast to visual fidelity or narrative complexity" (2015, 3).

Mark Deuze and Chase Bowen Martin similarly mark the importance of gameplay mechanics and state:

> With smaller file sizes many of the assets used to promote realism, such as graphics and audio, are devalued, as they are generally the largest types of files in the product. In turn, independent game developers more often must rely on abstractions over realism in their art assets, and game mechanics are more often prioritized because of the play sessions of the games generally being shorter. (2009, 280-281)

Game mechanics are thus a crucial feature of indie games. In my analysis of the indie games that follow, I seek to demonstrate how game mechanics become tied with the music and sound effects to create unique gaming experiences.

1.5.2 Ambience and immersion

Although not all game music is ambient, ambient music is a prominent feature of a large number of games, AAA and indie, and features to a greater or lesser extent in all three case studies in this thesis as well as in my own compositions. By ambient music I mean music that displays a lack of distinctive musical features–no strong sense of melody, rhythm or harmony, with timbres that are often unobtrusive and 'atmospheric' – and which could be considered an enveloping background sonic 'troposphere'. Ambient music tends to blur the sound

design/music distinction and is often built from layered electronic textures. For Brian Eno, who is sometimes considered the father of ambient music, it is music which "must be able to accommodate many levels of listening attention without enforcing one in particular; it must be as ignorable as it is interesting" (Eno 1978). The new *Grove Online* dictionary forgoes the term 'ambient' and opts to use the term 'environmental music' instead. The New Grove defines 'environmental music' as music:

> [that] encompasses a broad category within which are several types of music, each serving different functions and inspired by different aesthetics. Two common uses of the term refer either to music that is intended as a pervading atmosphere rather than as an artistic expression to be listened to for its own sake. (Isacoff 2014)

While this definition is quite vague, it draws attention to ambient/environmental music's function and that function is to create an atmosphere. As I define ambient music further you will see that musical characteristics are not what define ambient music but more the purpose and function of that music that defines it. I will be using the term 'ambient' instead of the term environmental throughout this thesis.

In games, ambient music tends to sit in the background of the player's consciousness so as to avoid distracting attention away from the gameplay. Nonetheless, ambient music may also be used to create mood or a particular atmosphere – a mood of calm, for example, or one of fear and anxiety. Aaron Marks argues that "In an effort to battle unwanted silence, ambient music can be used to maintain continuous audio activity within the game environment" (2009, 235). Continuous audio activity in a game is likely to aid the immersive experience for players, creating a particular sonic environment for a game or a section of a game. Because the musical qualities are deliberately designed to be fairly inconspicuous, ambient music is able to create a continuous audio environment while avoiding repetitive, tiring harmonic or melodic features.

My analysis will reveal how ambient music functions in all three case studies and informs my compositions. In addition, I consider some of ambient music's limitations, for example, its defining characteristic – a lack of 'strong' musical properties – means its signifying capacities are fairly low, thus limiting its ability to guide a player through a game or supply narrative information.

1.6 Chapter breakdown

In this study, three of the chapters will be made up of case studies, one for each of the games I am analysing, along with a chapter that is a reflection on my own compositions, which have been informed through the research process.

In Chapter 2, I look at the video game *Braid* and explore how it uses licensed music to great effect, as opposed to specifically composed music which is more commonly seen. I also examine how game mechanics are tightly connected to the musical design.

In Chapter 3, I consider the game *Fez* and its use of procedural and adaptive audio. *Fez* has its own audio interface that allowed the composer Rich Vreeland to experiment with the game's music and introduce random elements to the music, and uses unique musical techniques that react or correspond to what is happening on screen.

In Chapter 4, I explore the tension between autonomous, 'narrative' music that needs to develop over time and music that interacts tightly with gameplay, using *Journey* as my primary case study.

Chapter 5 consists of a reflection on my own musical work created during this research project.

Chapter 6 follows with a conclusion.

I hope with this research to uncover imaginative and unique compositional practices in the field of indie video games, and to aid other composers in future practice and research in indie video game music.

Chapter 2

Braid: Musical Interactivity in a Game of Strands

2.1 Chapter overview

One of the key aesthetic and technical features that distinguish indie games from their large-scale studio counterparts, according to game music scholar Michael D'Errico, is "a focus on game mechanics in contrast to visual fidelity or narrative complexity" (2015, 192). This chapter considers music's role in the indie puzzle/platformer game *Braid*, and explores the unique ways in which the game's mechanics, and music are linked. After a brief discussion of the game's history and context, and a synopsis of its gameplay and narrative elements, I move on to examine the game's music, none of which was composed specifically for the game. Foregrounding the compiled music's instrumentation and style, I consider issues around the licensing of pre-existing music in games, and possible reasons for the choices of music in the game. I then explore the close, dynamic relationship between music and gameplay.

2.2 History, context and narrative

Braid is a puzzle/platformer game created by Jonathan Blow. It was released for the Xbox 360 in 2008and for PC the following year.

The year 2008 was a significant year for indie games, with the release of a number of titles that sought to position themselves in opposition to what some viewed as a "glutted, uninspired, and corporatised game market" (D'Errico, 191).[1] Blow himself describes wanting to develop serious, thoughtful games within-depth content; games that offered more than simply an entertaining diversion for the player (Blow 2012). Blow argues that while AAA game developers often assess their games in terms of how "fun" a game is to play, he believes a good game should offer more; to be challenging, thought-provoking and interesting, and which may not necessarily appeal to a large group of people (Ibid). Blow describes his own approach to game

[1] Among the significant indie games released in 2008 were *Castle Crashers*, *World of Goo*, *N+* and *Braid,* all of which remain popular.

development as “respect[ing] the player as an intelligent person who can figure things out and who wants to discover things or come to understand more things than they knew at the start of the game” (Ibid). For Blow, games should avoid wasting the player’s time by saturating the game with a lot of filler material merely to increase gameplay time (Ibid). In contrast to most indie games, AAA games are generally designed for a wider market and presented so they can be played by a wider demographic of people and this may lead to the game 'hand-holding’ the player through much if not all of the game. This is an important design and philosophical approach, differentiating indie games from those of the major software companies (Ibid).[2]

Braid will generally take a player eight hours to finish, and on the surface is a kind of love story: Tim, the protagonist and player’s avatar, is on a quest to find his lost love, the princess. The narrative aspects of the game are communicated before each game world (of which there are six) in the form of in-game books that display text on-screen when the player walks over them. The first two books present the following text:



Figure 1 – Screenshot from Braid: *time and forgiveness, book 1*

[2] Another important difference is that AAA games are usually the work of large game development studios consisting of teams of artists and designers, while indie games tend to be made by individuals or much smaller teams of people.



Figure 2 – Screenshot from Braid: *time and forgiveness, book 2*

The story unfolds slowly. For the bulk of the game while the player interacts with the puzzles the game makes no reference to narrative elements save for a brief line delivered by a plush toy dinosaur named Greeter at the close of each world. “Sorry”, we see the Dinosaur say to Tim each time, “but the princess is in another castle”. In the penultimate level, Greeter appears for the last time and asks Tim if there was ever a princess at all. The final scene shows Tim chase the princess in what seems to be an attempt to save her from a large knight-type character. As he reaches the princess, the player is given a third-person perspective of Tim looking through her window. It then becomes apparent that the princess is in fact running away from Tim (the original scene was playing in reverse), and that the player (Tim) is not saving her at all but that she is being saved by the knight introduced at the start of the level. The princess is then taken away, leaving Tim alone in the final level.

The narrative, at least on the surface, is essentially a story of lost love and the game is a reflection on the nature of relationships, with the twist being that the player is in fact chasing the princess away as opposed to saving her. The story, however, takes another turn at the end of the game. Here, the player is once again presented with books and as we read through them another way of reading the narrative emerges. We are presented with more information about

Tim's life and childhood (Tim is described as an angry child), and we are told that as a child he was not always able to get what he wanted. As we draw closer to the final book, the phrase "[n]ow we are all sons of bitches" appears. This is a reference to words uttered by nuclear physicist Kenneth Bainbride to J. Robert Oppenheimer immediately after the first nuclear bomb test. For gamers who pick up on this reference, it could shift the focus of the story and present the princess as a metaphor for the research and creation of the atomic bomb. From multiple sources, including the Wikipedia entry for *Braid*, various forums and an interview with Blow himself, the explanation is that the princess was only ever a symbol for the concept of something out of reach, something that is more important than anything else in the world and something that the main character would do anything to grasp (Peligroy2k, 2011). Even though Tim seems to love the princess and the search for her more than anything in the world, she continually escapes him until the end when she is finally taken from him. The metaphor suggests a link between Tim and the creator of the atomic bomb, and the princess and the process of creation. The more Tim attempts to keep the creation from the world and save the world from its inevitably destructive fate the more it escapes him until it finally reaches the world. The story could also be viewed as Tim dealing with his guilt about the creation of the atomic bomb and his attempts to appease that guilt (Ibid). The game has an alternate ending in which the princess is shown exploding, giving weight to a reading of her as a representation of the atomic bomb. Interviewed about the game by Chris Dahlen, Blow argues that the game is a philosophical exploration of existential questions:

> One of the juxtapositions in Braid is that pursuit of the emotional, of the human level – whatever we are driven to pursue as interacting, emotional beings, and what certain people are driven to pursue as physical, mental, scientific beings that inhabit this universe that we're in. And how do we resolve those two very different kinds of existence? How do we make sense of them? (Blow quoted in Dahlen, 2008)

Blow considers *Braid* a reflection on his ideas of temporality: "that there is no arrow of time at the quantum mechanical level", and how we as humans understand and interpret time: "why it seems to flow in one direction" (Ibid). This view is reflected in the way the player interacts with Tim throughout the game (perhaps the fact that the name Tim includes the first three letters of *time* is significant here).

There are clearly many strands (hence the game's title) or layers to the story, and as a text it can be read on a number of levels. Blow explains that "there are all these layers in the graphics and in the emotion", and I will argue that these layers are represented in the story as well as the music (http://www.gamespot.com/articles/spot-on-the-music-of-braid/1100-6197644/).

Blow's approach could be likened to that of an *auteur*, a term borrowed from film criticism, in that he devised and created the game singlehandedly, and it would appear to be a very personal artistic statement and a real labour of love (in this sense, the game is classically indie). One of Blow's innovations with *Braid* lies in a gameplay mechanic that enables the player to go forwards and backwards in time. Some AAA games such as *Prince of Persia* also explore this idea but it is not a common mechanic. Music is closely linked to this mechanic in that the musical soundtrack is designed to be played both forwards and backwards depending on whether the player is travelling forwards or in reverse. I will explore this unique link between gameplay and music below.

2.3 Music in *Braid*

*Piece marked with an asterisk may feature in certain areas with slight variations such as an increased pitch or tempo or also slightly warped compared to the version found on the soundtrack.

Track Name and Artist	Featured World	Instrumentation
'Maenam' Jami Sieber	World Selection Screen (Refer to Audiovisual Example 1)	Cello, esraj, Burmese harp (saung byat)/Korean zither and saxaphone
'Downstream'* Shira Kammen	World 2, 6 and 1.	Classical guitar, violin and percussion
'Lullaby Set'* Shira Kammen	World 2 and 4	Piano and violin
'Romanesca'* Cheryl Ann Fulton	World 3, 4 and 6	Classical guitar and violin
'Long Gone Past'* Jami Sieber	World 4, 5 and 6	Burmese harp, piano, viola and soprano saxophone
'The Darkening Ground' Jami Sieber	World 3 and 5 (Featured on boss levels)	Electric cello, treated percussion, ambient electronic sounds.
'Undercurrent' Jami Sieber	World 5, 6 and final level	Electric cello, udu and viola
'Tell It By Heart'* Jami Sieber	World 3 and 5	Cello, viola and Burmese harp
"Wiegenlied: Guten Abend gute Nacht" Johannes Brahms	World 3	Glockenspiel
'Rock-a-bye Baby' Traditional	World 3	Glockenspiel

Figure 3 – Inventory of music in Braid

Braid's pre-existing music was sourced from a library music licensing service called Magnatune. Blow told the gaming website Gamespot that he "decided to license existing music instead of commission it partly for budget concerns, and partly because he wanted it to have meant something to the composer" (http://www.gamespot.com/articles/spot-on-the-music-of-braid/1100-6197644/).The use of pre-existing music in AAA video games is fairly common practice but quite unusual in an indie game. While pre-existing library music from fairly unknown composers might be a cheaper option for game designers than bespoke, tailor-made music, this is certainly not always going to be the case. In the case of the *FIFA* game franchise, for example, one would imagine licensing the Radiohead, Muse or Fatboy Slim tracks would not have been a financially-motivated decision but rather made as an attempt to garner a wider audience for the game, and for the signifying qualities of the well-known pop songs that affect the experience of playing the game. This kind of use of pre-existing pop music in games, however, tends to function purely as an aural accompaniment and the music is rarely closely synchronized with the gameplay.

For Karen Collins:

> One of the most significant ramifications of choosing licensed music in games is that there is a limited adaptability inherent in most popular music, where-as games require songs that may need to adapt to gameplay states or player interaction. Licensed songs are (for the most part) designed as linear music, and therefore the placement of this music in a game is generally limited (to cinematics such as cut-scenes, titles themes, credits and so on), as is the genre of game where such music may be appropriate (such as racing games, which have a more linear playback). (2008, 119)[3]

Braid's pre-existing music is, however, used far more interactively than Collins argues is the norm.

The table above (Figure 3) lists the pieces of music Blow selected for *Braid*, and outlines which pieces of music appear in each of the six game worlds. The player starts the game in an area that serves both as the starting area and a transition area where the player can select doors to travel to each new world (see Audiovisual Example 1 – 'Maenam' and World Selection on the accompanying flash drive). When the player starts to play the game, only World Two is offered

[3] Cut-scenes are non-playable elements of a game that serve to set the scene, such as in-game cinematics.

as an option for the player to select – not World One as would be expected – World One is in fact the final world that the player encounters during the game (this could be viewed as Blow's comment on time as a nonlinear concept). In the initial transition area, music used to accompany the game is 'Maenam' by Jami Sieber, an almost six minute-long piece that loops on conclusion. Each game world thereafter features a selection of the eight pieces from the soundtrack. Other than World Four, each world features no more than four different pieces of music and, besides World One and Two, all the worlds feature 'Tell it By Heart' and 'Long Gone Past', both also composed by Sieber (I choose to group these songs together as they have a shared bass line that can be seen in Figure 5).

2.4 Recurring music

An overall structural design in the placing of pre-existing music in the game can be discerned: 'Long Gone Past' and 'Tell It By Heart' reappear in numerous worlds effectively functioning as recurring material between other pieces, creating a kind of Rondo form at the macro level. These pieces become audio signposts the player comes to expect, almost like leitmotifs in the game. 'Maenam' is heard every time the player needs to transition from one game world to another, thus also creating this sense of recurring material. It is also interesting to note that some of the pieces themselves feature Rondo form ('Romanesca' and 'Lullaby Set') and that the macro form of the game as a whole and its use of music is reflected in the micro structures of some of the game's individual pieces of music.

Below I discuss in greater detail the stylistic characteristics of three of these recurring pieces that give the game much of its sonic identity.

2.4.1 'Maenam'

'Maenam', by the American cellist Jami Sieber, features an *esraj* (a bowed Indian stringed instrument, also called an Indian harp) playing a drone on D, and a cello playing what sounds like an improvised melody. The piece also features a Korean zither. As the first piece of music in the game, it sets the tone for the game as a whole and creates a laid-back and ambient atmosphere with hints of non-Western musical influences. The music is peaceful in mood and

according to Sieber the title of the piece means river (http://www.gamespot.com/articles/spot-on-the-music-of-braid/1100-6197644/). The image of a river is well-conjured by the slow and drawn-out atmosphere created by the music as it takes some time to build and features swells and dips of both the melody and the drone. This piece has a minor feel to it, however the melody makes use of both pentatonic and mixolydian scales (see my transcription of part of the melody in Figure 4 below where the first two bars are pentatonic with the rest in a mixolydian mode). The mixolydian scale appears in a number of pieces used in the game including 'Downstream' and 'Lullaby Set'(see Figures 6 and 7 below) and serves as a feature that ties much of the music together.

2.4.2 'Tell it By Heart' / 'Long Gone Past'

'Tell it By Heart' and 'Long Gone Past', are regularly recurring pieces of music in the game and both also feature the same ostinato bass line. The bass line thus serves as a kind of main theme for the game, a defining and unifying part of the game's sonic identity. I have transcribed the bass line in Figure 5 below (the first four bars showing the original bass line featured in 'Tell It By Heart' and then bars 6-9 showing a variation used in 'Long Gone Past'). *Braid*'s soundtrack, despite being made up of a compilation of different composers' work, and in contrast to AAA titles that are also contain compiled scores, has a consistency and far greater sense of unity –an art game that sets itself apart from the merely entertaining big studio games.

Like much of the music in *Braid*, 'Tell It By Heart' is modal (dorian, in this case), while 'Long Gone Past' moves through different modes. This modal texture also helps to create a sense of unity in the game's soundtrack.

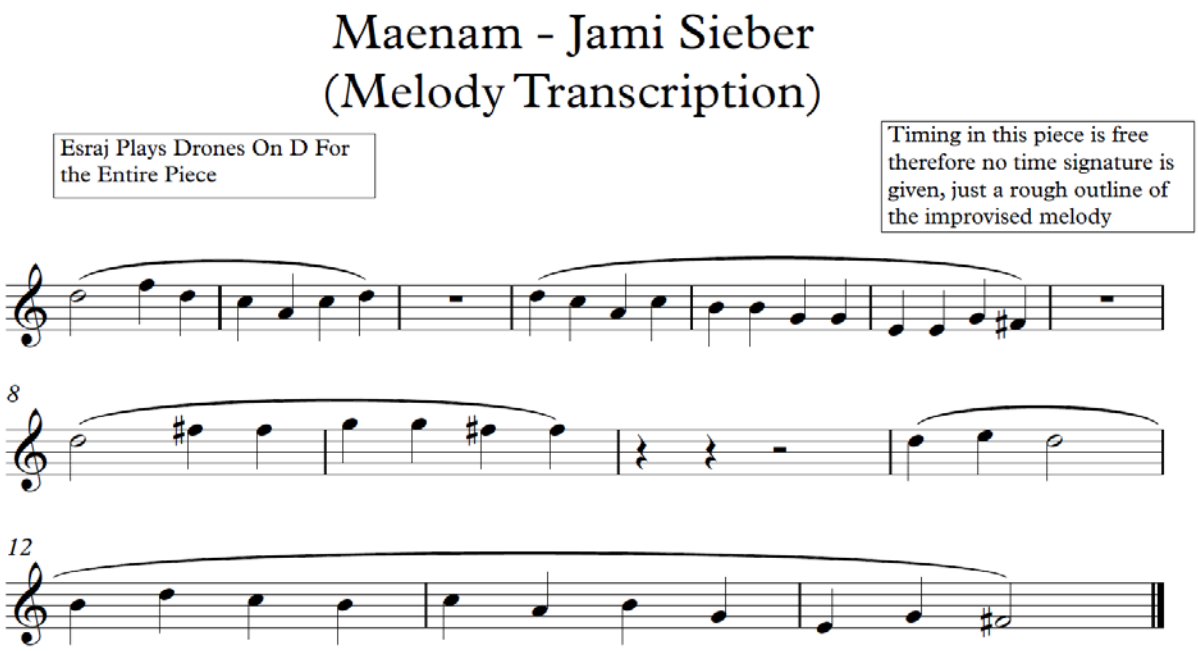


Figure 4 – My aural transcription of 'Maenam' by Jami Sieber



Figure 5 – My aural transcription of a section of 'Tell It by Heart'/'Long Gone Past' bass part by Jami Sieber

2.5 Choosing the music

In an interview with Gamespot about the game's music Blow explains that there were two goals when selecting the music: aesthetic goals and functional-gameplay goals (http://www.gamespot.com/articles/spot-on-the-music-of-braid/1100-6197644/). For Blow, the length of the song was important in achieving these goals as a player often spends ten minutes or more trying to figure out a single puzzle; short, looping tracks would inevitably feel too repetitive and cause frustration for the player (Ibid). The gameplay experience becomes frustrating when a two-minute or less track repeats endlessly during a puzzle solving situation. Collins makes the same point, arguing "lengthy games [or game sections] require much more variation in the soundtrack, since the player will be engaged with the sound for a much more significant amount of time" (2008, 137). It is therefore important that a composer of game music or someone selecting music for a game takes into consideration the overall gameplay style before selecting or composing music. A first person shooter game will not benefit from the same approach as this type of game is generally fast-paced and high in action and therefore a more driving soundtrack would be more appropriate. Shorter looped tracks might not be as inappropriate as they may be for a puzzle/platformer game.

The music was selected to create the right atmosphere even before the game's artwork was fully realised. Blow describes how he "wanted [the music] to be organic and complex because that's the kind of mood the game is trying to set as a whole" (2008). Certainly Blow's idea of organic music comes through in the improvised nature of much of the music, in the acoustic, sometimes non-Western instrumentation, and the traditional-sounding modal melodies; the music does not sound as if it was made on a computer – another signifier, perhaps, of Blow's desire to differentiate the game as a more weighty, thoughtful, art game than simply one that entertains.

2.5.1 Time-travelling – forwards and backwards music

As discussed in Chapter 1, music in video games works in a dynamic fashion as it has to respond to either the player's direct actions (interactive audio) or what is happening in the world around the player (adaptive audio). *Braid's* music can be considered mainly interactive as I

demonstrate below, but the level of interaction is more complex than that of a sound effect where the press of a button would normally yield a single sound.

In *Braid*, if the player chooses to take no action and stands still in the game world, music will play out linearly and will simply loop indefinitely. However if the player chooses to play the game as intended, the soundtrack will be played backwards and forwards at varying tempos as the player attempts to solve the game's puzzles. In other words when linked to the gameplay mechanic of being able to move through time, the linear, forward-moving nature of the pre-existing music is undermined as the player progresses through the game (see Audiovisual Example 2 – Time Travel Mechanic Demonstration and 'Downstream' for a demonstration of this gameplay-music mechanic).

The pieces of music Blow compiled for *Braid*'s soundtrack share a number of instrumental characteristics that work to create a sense of unity in the game as a whole. But these instrumental characteristics are also directly related to the gameplay and in particular to *Braid's* time-travelling feature. The instruments chosen are primarily stringed instruments with the most prominent instruments being the violin and cello. In addition, an *udu* drum is used in the piece 'Undercurrent' and a bass drum and some percussion in 'Downstream'. These are the only tracks that feature percussion. The reason for this choice is likely to have been that when playing *Braid* the act of going forwards and backwards in time is necessary to complete most of the puzzles. This inevitably means the player ends up listening to small sections of certain compositions a number of times both forwards and backwards. The use of stringed instruments makes this constant reversing and replaying of the music easier to listen to and provides the game with its unique musical character. While the guitar and piano are more percussive-sounding instruments, with a harder attack than the other stringed instruments, the sound they produce in reverse is not unpleasant and, crucially, is more identifiably 'backwards'-sounding – drawing attention to one of *Braid*'s unique game mechanics. French audiovisual theorist Michel Chion introduced the concept of vectorisation, where an image or a sound with no vectorisation might be considered 'reversible', in other words it is, "not marked with any sense of past or future" (Chion 1994, 19-20). While sounds tend to have more vectorisation than

moving images, they may not always be vectorised – a pure sine wave, for example, which sounds identical both ways, and even the sound of a violin, playing a bowed legato line is very similar forwards and in reverse. While some of the instrumentation that makes up *Braid*'s music has very little vectorisation and therefore would sound 'musical' in either direction (the bowed strings, for example), other sounds are more vectorised in time (the piano and percussion) in order to both draw attention to the forwards/backwards mechanic and to attempt to draw the player into *Braid*'s unique world.

2.5.2 'Exotic' instrumentation

Braid's music, although composed by largely North American composers, features a number of instruments that are not often heard in video games, and displays influences from a variety of cultures, showing Celtic and south-east Asian musical influences. Along with the Western instruments discussed above, *Braid*'s compiled hybrid score also features a Burmese harp in the two recurring pieces of music in the game ('Tell it by Heart' and 'Long Gone Past') as well as an *udu* (featured in 'Undercurrent' and can be heard in Audiovisual Example 4 – World Six Mechanic and 'Downstream') and the *esraj* mentioned above. To Western ears, at least, these may appear as exotic sounds, creating unusual textures and are an additional innovative aspect of the game's music. The use of unusual instruments places the listener somewhere unexpected and imbues a sense of something unknown to both the gameplay and the music (if potentially trading in orientalist tropes – the mysterious, exotic, unknowable 'East', etc.).

I would argue that Blow is challenging the idea of what is Western and what is apparently exotic by combining all these different sounds within one project. The use of signifying musical elements drawn from a wide range of musical cultures (Irish, Indian, Chinese, etc. – perhaps a rather-too generalised Eastern 'other') is an aesthetic choice that seeks to challenge what one might expect from a game soundtrack. It could also be seen simply as a soundtrack created in the age of iTunes/iPods, where the entire world's music is accessible to us at the click of a mouse. An example of this hybrid music is found at the beginning of the game: the player is introduced to the game with a piece of music ('Maenam') that hints at south-east Asian influences. This cultural reference is quickly shifted with the use of traditional Irish-sounding

music in World One (evinced by the use of violin, cello and nylon stringed guitar, as well as folk-sounding modal melodies). Music that appears later in the game incorporate a multitude of styles; Jami Sieber's *Undercurrent*, for example, where electric cello and viola modal melodies are heard over an *udu*-driven percussion track and a C-drone.

The use of hybrid, cross-cultural musical sounds is also reflected in the game's visual style. *Braid*'s graphic artist, David Hellman, explains that, "[the music] certainly set a tone [...] when the game was [in an] early [stage of development] and the graphics were rudimentary the music was certainly one of those things that made a strong impression as far as the atmosphere of each world" (http://www.gamespot.com/articles/spot-on-the-music-of-braid/1100-6197644/). A good example of this can be seen in the different visual styles of each world. The first world features more Celtic-sounding music than the later worlds, and the visual style of this world is dominated with green rolling hills, a kind of bucolic English/Irish landscape. The later worlds feature darker and more specifically Asian-sounding music in scenes with more muted colours as well as snow and mountains, which could possibly conjure Indian, Chinese or Japanese landscapes. Thus, the choice of music can be seen to have a visual analogue, cementing the link between music, visuals and gameplay.

This concludes the overview of *Braid's* style, instrumentation, musical selection and visual style and leads us to a more in-depth look at how the music of *Braid* interacts more directly with the gameplay.

2.6 Musical form and analysis in World Two

Each of *Braid*'s worlds features a new gameplay element that affects the puzzles and in most cases the music. Below I explore and analyse the music of World Two.

In the first playable game world (World Two) the player is introduced to the basic mechanics of the game, which involves moving, jumping and climbing over obstacles to find various pieces of jigsaw puzzle scattered around the level. The player is only introduced to the special time-travel mechanic when the player dies by either falling into a spiked pit or is killed by one of the

various monsters found in the level. The game then displays on-screen the button that allows you to move back in time while freezing the game and the music (see Audiovisual Example 2).

As the level progresses the puzzles become more intricate and the ability to move through time allows one to re-do precise jumps and timed events. The manner in which the music interacts with the gameplay on this level is quite minimal compared to the more complex ways the player interacts with time, described later. The music featured in this world ('Downstream' and 'Lullaby Set' by Shira Kammen) is bright and pastoral, using string instruments and in a major key. 'Downstream' makes use of acoustic guitar, violin, and some percussion and produces a Celtic folk atmosphere. 'Lullaby Set' uses only piano and violin and also has a Celtic atmosphere, but here it is less pronounced than 'Downstream'. 'Downstream' is written in the key of A-major key and features the tonic minor key in the D section of the piece. Overall the song has a very calming and peaceful sound. The violin begins playing a melody in an ionian mode but includes a flattened seventh later in the melody that creates a mixolydian feel (See bar 10 in Figure 6). The piece is in a Rondo form. At 4:34 there is a tempo change, becoming faster and denser with added percussive elements. Up to the tempo change the form of the piece follows an A, B, A, C, A, D format with D repeating until the rubato and tempo change. The final section can be considered an E section that repeats until the end. An example of the section A chord structure is as follows:

A - F#m – E – D

A – F#m – D – E

A – G – D – E

A – G – E – A

What is interesting about this chord progression is that although many of the same chords are re-used, it shifts the order of these chords allowing for a more complex and extended melody line. Having a shifting structure to the chord progression and having longer melody lines works well within a game like *Braid,* as a shifting chord progression and interesting form and melody helps to hide a sense of repetition. A transcription of the melody for section A can be viewed

below in Figure 6 and shows that not much of the melody is repeated except for the parts in bars 1-2 and 5-6. This is also true of the melody in sections B, C and D (note also the use of the mixolydian mode, a defining feature of many of the pieces in *Braid*). The use of the flattened seventh in a number of pieces creates a common thread through the soundtrack and also creates a juxtaposition of light and dark sounds; the mixolydian mode – consisting of a major scale with a flattened seventh gives it both a major and a minor feel and this quality of the mixolydian scale reflects the mood of the game as it also shifts between dark and light moods.

The second piece of music used in this world, 'Lullaby Set', has a more complex form. The piece consists of four distinct sections (which I call A, B, C and D) but each time a section is used again, it is varied. These variations have an improvisatory feel, however the structure of the piece is quite rigid. Structurally, the music takes this form: A, A, B, B, A2, A2, B2, B2, C, C, C, C, B3, C2, C2, C2, C2, B4, D, D, B5, D, D, B6, B6. The use of multiple sections and variations of the repeated material helps the music not to feel repetitive in a similar fashion as mentioned above in 'Downstream'.

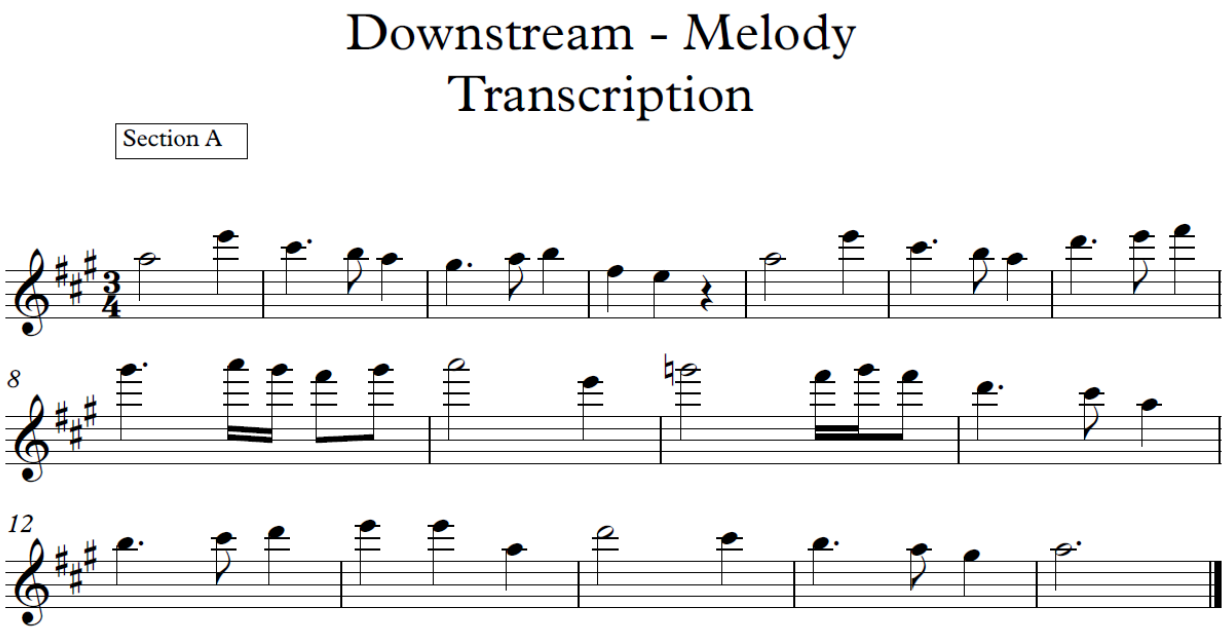


Figure 6 – My aural transcription of 'Downstream' by Shira Kammen

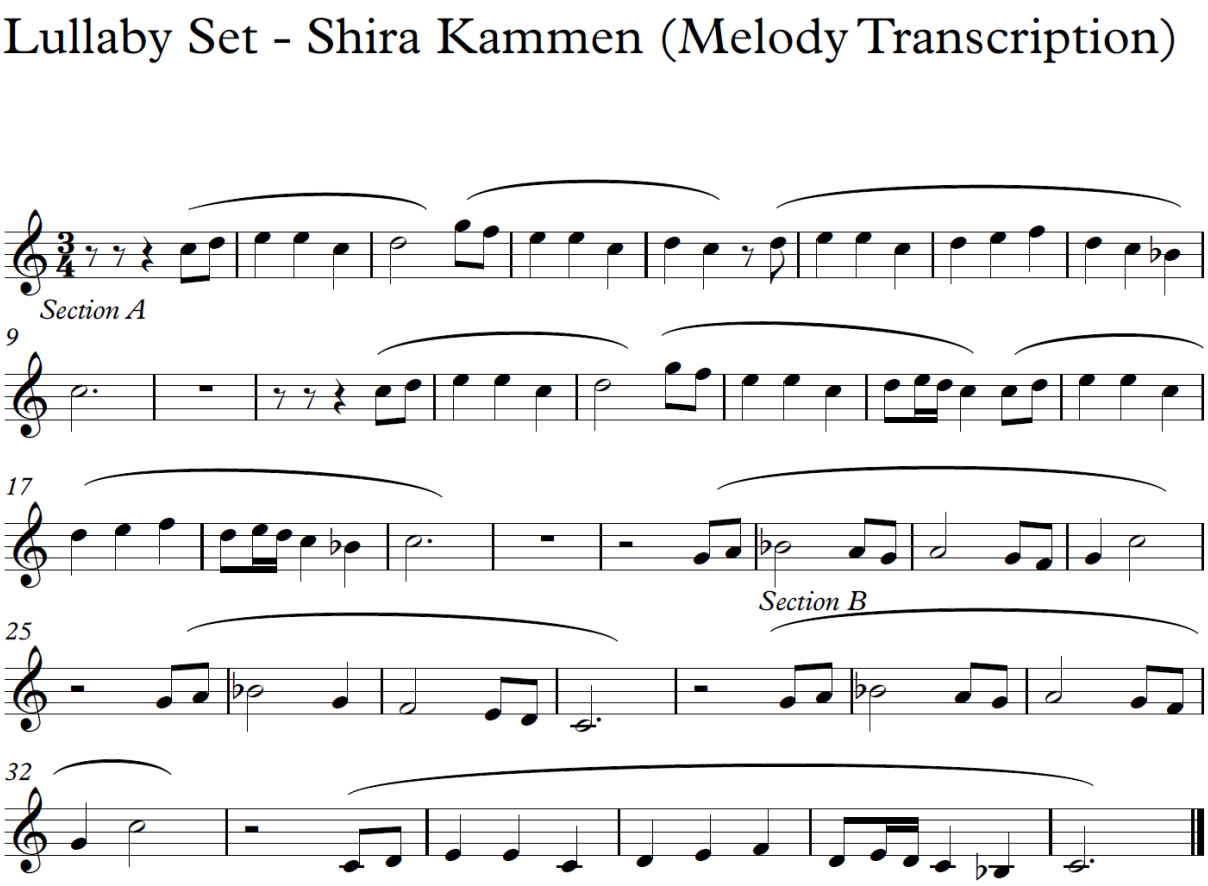


Figure 7 – My aural transcription of 'Lullaby Set' by Shira Kammen

Though this game world does not feature much interaction between the music and gameplay save for the standard time-travel mechanic, Blow's selection of music creates the impression of constantly varying musical flow – while material is looped and repeated, the repeat is hard to discern and the music is unlikely to be too wearying for the player.

I now move on to discuss the more intricate interaction between the music and the player with an analysis of music and gameplay in World Four and World Six.

2.7 Music, Gameplay and the Player

Game World Four adds a variation to the time-travel/backwards-forwards gameplay mechanic, closely tying the speed and progress of the player's progression through the level to the accompanying music. As the player moves forwards (to the right of the screen) the music (a

music-box version of Brahm's 'Wiegenlied: Guten Abend gute Nacht', Op. 49, No. 4, followed by the traditional Rock-a-bye Baby lullaby) rises in pitch and speed rather like a tape machine or record player speeding up, and, once it reaches normal playback speed, continues to sound as long as the player continues to move in that direction. When the player moves to the left of the screen the music plays in reverse and also features the same speeding up effect. This adds another unusual dynamic as when you move to the left of the screen and then reverses time the music plays out forwards (see Audiovisual Example 3)**.**

Later in the level, the music box lullabies are replaced by Shira Kammen's 'Lullaby Set' scored for piano and cello as well as other pieces of music from elsewhere in the game ('Long Gone Past' and 'Romanesca') which are subject to the same speeding up/slowing down, backwards/forwards treatment. Once again, recurring music is used to create a sense of unity in the game as a whole, giving the impression of an integrated artwork – but with each world characterised differently with a particular game mechanic in a dynamic relationship with the music.

The game's manipulation of the compiled music on this and other levels suggests a slightly different way of thinking about musical linearity: if the world's puzzles are completed correctly, the player will experience the music in its intended, 'forwards' form. However the act of attempting to complete the puzzles will lead to many wrong attempts and strange, perhaps slightly grating, iterations of the soundtrack. The playing of the soundtrack in its original form could therefore be considered a reward for the player as they correctly complete the level. The linking of the gameplay element of this world to music makes this game world and its music unique even though certain tracks are being reused, the way the gameplay affects the music allows for a fresh use of tracks that in other circumstances might be considered stale.

Game World Six adds another gameplay element related to time that directly affects the music. In this world the player creates a large bubble that when entered has the effect of slowing down time. This mechanic is used to slow certain parts of the environment in order to complete puzzles that would be too difficult at normal speed. As the player reaches the edge of the bubble, his avatar and the sound slows down dramatically (the same kind of tape-slowing effect

experienced in World Four) and continues to stay slowed-down as the player's character remain in the bubble. As soon as the player leaves the bubble the game's music and sound effects speed back up to normal as the player moves further away from the bubble. While inside the bubble the player may choose to remove the bubble instantly, thereby returning the game to normal speed (see Audiovisual Example 4). It's a strange effect: surreal and dream-like. Here once again Blow has designed truly interactive audio that allows music that has already been heard to feel fresh (refer to Figure 5 for a list of the pieces used in this area). One of the conventional functions of video game music is to spatialise the game, to provide musical characterisation for particular areas or worlds of the game. Blow's use of music certainly provides this function, but not with music unique or exclusive to each world, but rather through unique kinds of manipulations of the music common to a number of levels/worlds.

2.8 Conclusion

Andrew Smith has argued that, "temporally resistant audio files" fit uncomfortably into interactive contexts and that the concept of interactive audio in games is essentially a "myth" (Smith 2014). Blow, however, has created a unique solution to the problems associated with the audio of videogames: while the music may loop in the game, and is certainly reused, by linking gameplay to music at a structural level, the game's music rarely feels repetitive, and is therefore effectively nonlinear and fully interactive.

Braid unsettles Collins' description of the way video games tend to use licensed music. If licensed music in games has tended to be used unimaginatively, a toe-tapping, linear, non-interactive accompaniment to the gameplay, *Braid* demonstrates how an ingenious use of a limited amount of licensed music can be effective in creating an unified, original and dynamic soundtrack. *Braid* presents a useful example to composers or game designers wishing to create music for their games that is not just an afterthought, instead imbuing a mood or character in their game as an inherent design choice that weaves all the strands of a game – gameplay, visual style, narrative and overall experience – into a cohesive whole.

Blow's approach to game design, evidenced in large part through an innovative use of music, might be thought of as quintessentially indie: a video game designed by a small team far less

interested in pleasing a mass audience than in creating an original work of art, while at the same time offering solutions to the intractable issues of repetition and interactivity of music in games.

Chapter 3

Fez: Dynamic Music in Non-Linear Games

This chapter considers the indie video game *Fez*, focusing on the game's interactive/adaptive music composed by Rich Vreeland, aka Disasterpeace. *Fez* is a nostalgic game in many ways, clearly referencing the look, sound and feel of early, 8-bit-era video games, but, with its far more sophisticated game design technology, is able to do much more in terms of an immersive gaming experience than any of those early games ever could. I examine the game's use of a first-person 'point of audition' in a mainly two-dimensional, third person game, and explore how Vreeland's largely ambient score is able to carry distinctly narrative information. My investigation will also reveal how Vreeland comes up with original solutions to the inherent difficulties of interactive, non-linear music through the use of 'Fezzer', the game's specially-designed system for coding its dynamic audio.

3.1 *Fez* – an introduction

Fez is a puzzle-platformer game that was designed by indie game developer Phil Fish and released in April 2012. The game gained critical acclaim after being featured in the documentary film *Indie Game: The Movie* (2012)and by the end of 2013 had sold one million copies (Matulef 2013). The team working on *Fez* included programmer, Renaud Bedard who worked closely with Vreeland to create music that was highly *dynamic*, a term I unpack in detail in this chapter (Vreeland 2013). Unlike *Braid,* which was created almost singlehandedly by Jonathan Blow, *Fez* was created by a team of people, each of whom was responsible for a particular aspect: art, music, sound effects and programming. This kind of creative collaboration and division of labour in the production of a video game is the norm in indie game studios, however, the teams of collaborators are far smaller than those behind the production of AAA releases.

The game, which would take a player around ten hours to complete, involves exploration and puzzle-solving over a number of different areas, most of which are presented with their own unique music. The game generates no real sense of jeopardy– none of the plants or creatures

the player comes into contact with are harmful, and even a fall from a great height will merely cause a reset to the pre-fall position – and the player's progress through the game will only be slowed by the time it takes to solve puzzles. As reviews of the game emphasize, the focus is on the joy of discovery: "With its ambient sound design, steady plat forming, lack of enemies and focus on exploration […] the only encouragement you have is the personal satisfaction of collecting everything and interacting with new, vibrant levels" (Lloyd 2014).

While the game has a definite beginning and end – areas of the game which players will always play first and last – the order in which other areas in the game are experienced is open to the player's choice. In other words, once the player has completed the first few areas, multiple paths are then available, and players aim to collect cubes scattered around the world to restore order to the *Fez* universe. Once enough cubes have been collected, the player will begin the closing gameplay. When the player has completed the game, he or she may choose to start the game from the beginning and explore the same world again in order to unlock more secret or hidden areas, locked chests and challenges.

3.2 *Fez*'s sonic and visual aesthetic

The conceit at the heart of the game is that it is a two-dimensional platform game set in a world that is in fact three-dimensional. While the player is able to see just one side of the world at a time, it can be rotated either ninety degrees to the left or the right in order to move to areas that were previously inaccessible (Audiovisual Example 5 – Introduction to Fez demonstrates this mechanic). For example two pieces of land that were separated by impassable empty space may be brought into alignment when the world is rotated, thus allowing the player to cross and make progress in the game. The tilting mechanism might also reveal hidden doors or passages that were previously inaccessible. This distinctive gameplay mechanic is the basis of most of the game's puzzles.

Point-of-view becomes an important part of the game: *Fez* is generally viewed from a two-dimensional, third-person perspective. This means the player does not experience the game through the protagonist's eyes (as would be the case in a 'first-person shooter' game, for example) but controls the character from a removed perspective. The game's music and sound

design, however, as I argue below, works to place the player in the protagonist's position; in other words, the player hears the world through the ears of the protagonist even though he or she does not generally see the world from his point-of-view.[1]

As the game starts, the player is presented with a brightly coloured village in an 8-bit, two-dimensional world.[2] As the player plays through the introduction he/she will notice that it is devoid of any music and the only sounds heard are sound effects and some ambience. You take the role of a square-headed, humanoid called Gomez and, as the game begins, Gomez receives a letter asking him to meet a fellow villager named Geezer at the top of the village. Once the player reaches the top of the village a sequence begins in which Gomez is gifted with a magical fez which allows him to see the *Fez* world in 3D (an example of this intro sequence can be found in Audiovisual Example 5 – Introduction to Fez). The player is then given the task of saving this virtual world by collecting 32 cubes scattered across the game before it collapses. It is only once you experience the world in three-dimensions that music enters, adding sonic depth to thenewly-3D game world, and marking the 2D-to-3D shift as a significant moment.

The music in *Fez,* published under Vreeland's artist name, Disasterpeace, consists of 26 different pieces, with each piece attached to a different area of the game. The game's synthesized score (generated largely with the Native Instruments software synthesizer plugin Massive) could broadly be described as 'ambient' in nature. One specific timbral quality of Vreeland's brand of ambient music relates to the soft distortion effect applied to the various software synths that 'breaks up' the tonal quality of the sound but in a very atmospheric, rounded way, not the harsh sound one might expect from a distortion effect. In addition, Vreeland's minimal musical palette which makes use of pad-like sounds as well as synthesizers with a larger 'attack' parameter, aid in creating his nebulous, musical ambiences. His use of delays, long reverbs and rhythmically-free music also assist in creating these textures and provide the hazy quality that has led a number of commentators to describe the music as

[1] If the player finishes the game, however, they are presented with sunglasses that allow them to see the world in a three-dimensional perspective.
[2] 8-bit art styles are also called pixel art and will be discussed later.

"ambient".[3] Vreeland himself describes the music as generally "very laidback [and] atmospheric" though there are moments in the game where the music is required to be "more energetic, to stand out" (Vreeland 2013).

Ambient music resists easy definition. Elena Boschi, Anahid Kassabian and Marta Garcia Quinones describe ambient music as a kind of "ubiquitous music" (2013). They argue that ubiquitous musics "defy a simple definition" and therefore may not refer to a certain style or genre of music but are "musics [that] could be defined as those musical events that take place alongside other activities" (2013, 6-7). Certainly the "ambient music" in *Fez* (if not most game music) would fall into this category: Vreeland's score unfolds while the player is engaged in exploration and puzzle-solving in the *Fez* world. However, not all the game's music would be considered 'ambient'. Brian Eno's more detailed definition of ambient music is more specific: "music that could be actively or passively listened to. Something that could shift imperceptibly between a background texture to something triggering a sudden zoom into the music to reflect on a repetition, a subtle variation, perhaps a slight shift in colour or mood" (Eno quoted in Kassabian 2013, 5).

Eno's definition proves a close fit for the music in *Fez*, which, while it is designed to be primarily passively listened to, does at times become more prominent, signalling directly an emotional/mood shift in the game, or to mark significant moments. According to Eno's definition, if actively listened to, ambient music still needs to challenge the listener and constitute a complete artistic work. It is not the specific style or mood that defines ambient music but its purpose and ability to give the images a sense of temporality, which is lacking when the audio is removed from the image (Chion 1994, 9-11).

The music in *Fez* could therefore be regarded as an *active* part of creating meaning in the game, drawing the player's attention to certain aspects, foreshadowing certain experiences (as I discuss below) while the player is engaged with another activity. It is also *active* in other ways –

[3] Sputnik Music's review of the *Fez* soundtrack makes reference to the influence of "electronic ambient" music on the score which "creates an engrossing atmosphere more reminiscent of early Tangerine Dream than the majority of 8-bit and chiptune music" (ComeToDaddy 2014).

as the player is not only a passive receiver of audiovisual information but also interacting dynamically with it, an aspect I explore fully in section 2.3 below.

3.2.1 Nostalgia and audiovisual associations with earlier games

Part of the attraction of *Fez*'s design is its nostalgic tribute to early video games: the transformation from a two-dimensional to a three-dimensional world, alludes to the history and development of video games. While *Fez* references both visually and aurally the style of earlier games its creators would have grown up playing, contemporary technology is used to make the game fresh and engaging for a demanding contemporary audience.



Figure 8 – Fez *from a three-dimensional perspective(screenshot from the game)*

Fez's visual content is designed with pixel art, reminiscent of 1980's and 1990's video games such as *Tetris* or *Super Mario Bros* but recreated in a modern context with more defined colours, objects and shapes. An example of *Fez*'s pixel art can be seen above in Figure 8 and below in Figure 9. Gomez and the platform he is standing on in Figure 9 are examples of the style of pixel art and the referencing of *Tetris* can be seen at night, in-game, as the stars form *Tetris* blocks. Pixel art is not easily defined; however a website featuring tutorials for developers

and gamers (www.raywenderlich.com) has posted a tutorial on the creation of pixel art by Glauber Kotaki, an experienced 2D artist. Glauber states that "the easiest way to define pixel art is by saying what is not pixel art: that is, anything that generates pixels is not pixel art… in the end, pixel art is all about taking great care about the placement of each pixel in a sprite, most often manually and with a limited palette of colours"(Glauber 2012).[4]

This pixel-art visual style has a sonic equivalent: Vreeland's synthesized musical palette for the game is often made to sound as if it was created on vintage computers – an 8-bit 'chiptune' aesthetic that references the sound of much earlier video game music (again such as *Tetris* and *Super Mario Bros* which generally have a lo-fi, synthesized quality).[5] Vreeland's use of this vintage sound is however another conceit in the game, and other parts of the game's sound world appear with a far more highly-defined sound quality: a far larger dynamic range and more immersive tonal qualities (including sub bass frequencies unavailable to earlier video game composers). This linking of an old video game aesthetic to a contemporary-sounding music production might also be considered a sonic analogue to the game's transformation from a two-dimensional to a three-dimensional world, a move from flatness to greater depth. *Fez*'s deeply integrated visual and sonic aesthetic creates a cohesive whole and distinctive style that helps make playing the game a satisfying and immersive experience.

This use of nostalgia also places *Fez* definitively as an indie game. As Lipkins states: "indie gaming today is frequently charged with being stylistically nostalgic, chronically recreating the 8- and 16-bit games of the creator's youths, but that nostalgia can only come from the implicit rejection of the present" (2013, 15).

[4] A sprite is a bitmap graphic that is designed to be part of a larger scene. It can either be a static image or an animated graphic. Examples of sprites include objects in 2D video games, icons that are part of an application user interface, and small images published on websites (http://techterms.com/definition/sprite).

[5] This was due to technical limitations in musical production at the time and music had to be synthesized via onboard sound chips in computers and gaming consoles.



Figure 9 – Fez *at night (screenshot from the game)*

In the next section I examine *Fez*'s music system and the dynamic nature of its soundtrack.

3.3 The *Fez* music system: adaptivity and dynamic audio

While music in a game like *Braid* is highly *interactive* – responding directly and near-instantly to decisions a player makes – *Fez*'s music and sound design is, on the whole, more *adaptive*, responding more regularly to game states (such as day and night) than to the player's specific actions.[6] The distinction Karen Collins makes between *interactive* and *adaptive* audio is, however, not always observed in discussions of game music. As Collins observes: "the term *interactive* is often used in discussions of audio, sometimes interchangeably or alongside terms such as *reactive* or *adaptive*" (Collins 2008, 4). Proving the point, Vreeland himself, in a presentation at the Game Developers Conference 2012 titled 'Interactive Audio in *Fez*', describes the music as operating "interactively" (Vreeland 2012).

A more useful term in discussing musical operations in *Fez* is *dynamic*.

[6] I discuss the differences between adaptive and interactive audio in Chapter 1.

Koji Kondo, the composer of the *Super Mario Bros* series, describes the four components of dynamic audio as:

1. The ability to create music that changes with each play through.
2. The ability to create a multicoloured production by transforming themes in the same composition.
3. The ability to add new surprises and increase gameplay enjoyment; and
4. The ability to add musical elements as gameplay features. (Quoted in Collins 2008, 139)

Both Vreeland and the game's programmer, Bedard, have described working closely together in order to create a game with a uniquely dynamic soundtrack. For Vreeland, it was "really nice having a programmer on the project who was super passionate about audio", and he describes Bedard as being open to any suggestions he (Vreeland) made that would help create music that had a higher level of "interactivity" with the player (Vreeland 2013). Bedard has said that the "game's music tracking/authoring tools" (the software system dubbed 'Fezzer') "were made so [Vreeland] could use them directly, so he was able to jam with ideas and hear them in the game without me interfering" (Robinson 2012). For Vreeland, "it was really nice to work with Renaud [Bedard] because I'd have an idea […] and I'd [ask if it could be implemented], and then thirty minutes later he would [say,] it's in there" (Vreeland 2013). This rapport between the two allowed for a much higher level of dynamic audio in the game.

Fezzer was created by Bedard working closely with Vreeland, and allows a user (in this case the composer) to load in a number of different audio loops or samples and then have a multitude of "timing logic" options available which would determine when in the game, and in response to what, a particular audio file is triggered (Vreeland 2013). These "timing logic" options are options such as choosing to trigger an audio file "after every …" *x* to *y* bars, or telling an audio file to loop between every *x* to *y* bars (see Figure 11 – *Fez*'s Music System) (Vreeland 2013). Other options include delaying when an audio file is first triggered by *x* amount of bars. The program can detect loop lengths, however tempos and time signatures must be inputted manually. The program can be told to trigger certain audio files in response to certain game states like day or night (the game has its own internal clock that determines the time of day), and also has an option to randomly order loops one at a time, ensuring the soundtrack plays

out in a unique way each time the game is played. Finally the pitch of the sound effects can be manually inputted into the engine as well so that they 'fit' the key of the music playing when they are sounded (an aspect I discuss in more detail below). This use of the engine meant particular kinds of dynamic audio were possible and offers an example of how basic audio knowledge is beneficial at a design level to a video game programmer. It also demonstrates how an interaction between the programmer and the composer can broaden the possibility of interactive and adaptive audio in video games, making the game, in Kondo's terms, fully dynamic.

One of the few examples of specifically *interactive* music in the game can be experienced on a hidden level where the player needs to make his/her way to the top of the area by climbing on platforms. What marks this area as different to other areas in the game is that the platforms the player needs to jump on in order to progress appear and disappear in time with the music. Therefore to complete the level, the player needs to jump onto the platforms in time with the music. The level's music is set at a steady 150/75 BPM, which is synchronised to the flashing platform blocks. A further layer of music-gameplay dynamism is added to the level by stacking up layers of audio: more instruments and harmonies are added the higher the player climbs. This is achieved, through Fezzer, by attaching layers of the music to different blocks in the level, so that as the player reaches a higher point, more layers of the composition are triggered and added to the music (see Audiovisual Example 7 – Music Gameplay in *Fez*). The piece of music, called 'Sync', begins with a synthesized, melodic introduction. After the first iteration of the piece it loops and drums are added. If the player chooses to remain in one spot, the piece will loop in this format indefinitely. As blocks flash in and out of time, synthesized, pitched sounds are triggered in time with the music, creating harmonies which increase in density as the player climbs higher up the level. In the last area of this level the piece moves to a concluding section where musical notes can be heard ascending multiple octaves before returning to their original pitches as blocks (also visually ascending) flash in time with these notes. The player needs to climb these blocks in order to complete the level. An image below, 'Figure 10– Music Gameplay in *Fez*', is a screenshot of Fezzer and shows how Vreeland was able to select "platform blocks

and then create sequences of notes" or sounds that would trigger as those blocks flash in and out of visibility (Vreeland 2013).

For Vreeland this presented an interesting challenge because "instead of thinking about order, when things happen in the music, it was more about proximity. Which notes do I want to happen near other notes, so that they sound pleasing" (Vreeland 2013). The synergy of visuals, gameplay and audio in this level effectively enhances the gameplay experience.

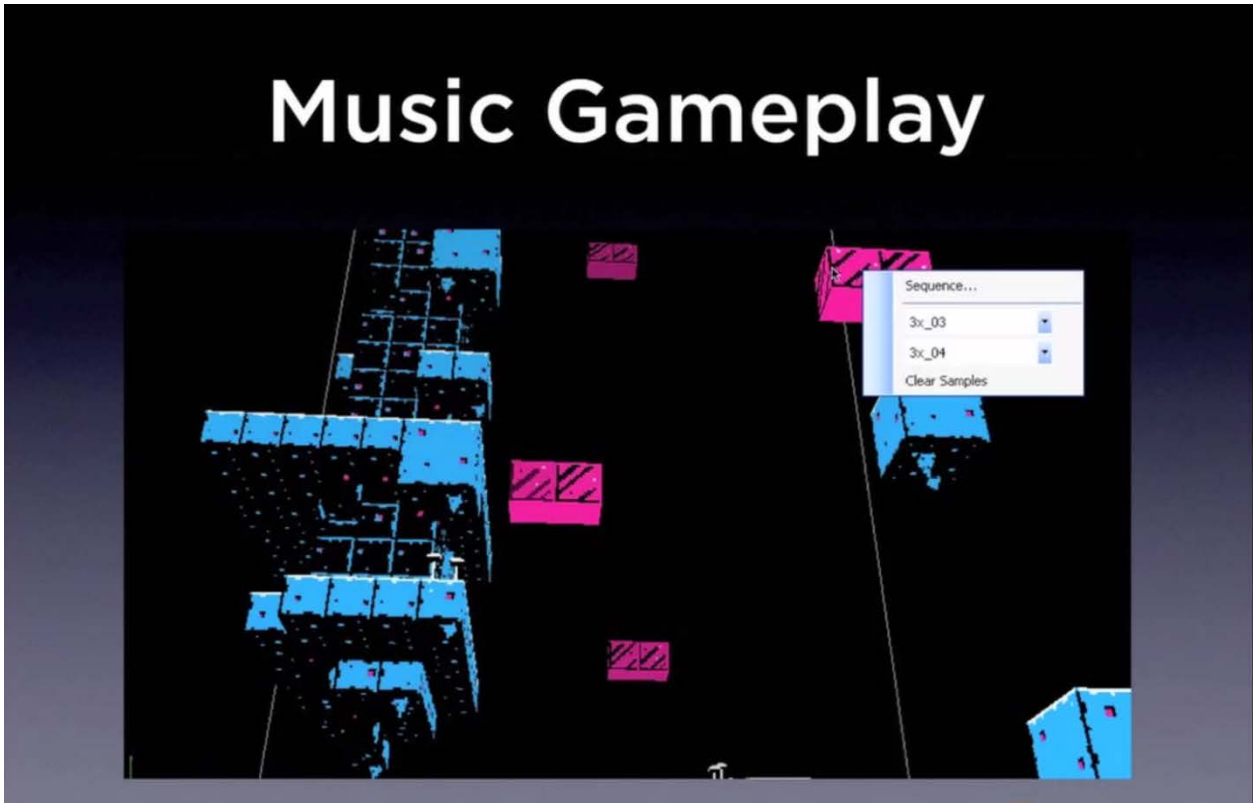


Figure 10 – Music gameplay in Fez *(Vreeland 2013)*

3.3.1 Musical perspective and immersion

Another example of dynamic audio in the game is experienced when players enter one of the many rooms found in the initial, village area. On entering a room, a filter is applied to the music making it muffled and softer-sounding, as if you were listening through a closed door. This occurs similarly when the player rotates the world so that Gomez is positioned behind an object, obscuring him from view (see Audiovisual Example 6 – Sound Perspective). In addition, if

the player enters certain empty rooms, the sound fades-out completely leaving only the eerie noise of wind. This effect puts the player in the perspective of the character he or she is playing and allows for a greater degree of immersion by using this sound device. This is unusual for a game where you are not usually viewing the world through a first-person perspective and in a sense the music might be considered diegetic as the source of the sound is seemingly coming from somewhere within the fictional world. When playing a game from a first-person perspective, the impression of experiencing the game seemingly through your avatar's eyes and ears generally allows for a far greater degree of immersion, a far greater sense of 'being there' than one would normally experience at a removed, third-person perspective. Here *Fez* is using an element from first-person games, albeit a first-person point-of-*audition* rather than point-of-view, to effectively increase the player's level of immersion in the game. Sander Huiberts confirms the importance of immersive audio:

> Most players acknowledge the enhancing influence of audio on immersion. Audio was confirmed as a game component that can stimulate […] immersion by enhancing the sensory connection, the feeling of flow and the feeling of empathy of the player. (Huiberts 2010, 118)

Fez's use of aural perspective, part of the player's audiovisual *sensory* immersion in Huiberts' categorisation of different kinds of immersion, is effective in helping to create the impression of the *Fez* world being a real world, and as a result aims to aid the player's suspension of disbelief, and increase empathy and identification as Gomez explores his environment. In short, it works together with visual elements to encourage the player to become more absorbed in the game. *Fez* also features the two other kinds of immersion Huiberts identifies: *challenge*-based immersion (in its difficult puzzles) and *imaginative*-based immersion (through exploring the game world). While *challenge*-based immersion may only be present in the music when playing a musical puzzle game, *imaginative*-based immersion would be aided by the general aesthetic of the music. One of the hidden levels, mentioned above, involves a form of musical puzzle and in this case the music then becomes part of the *challenge*-based immersion. While these three types of immersion may not all be experienced at the same time, they will all be encountered at some point in the game.

The lack of music at certain points in the game is also noteworthy – about 20 per cent of the game has no music at all. Vreeland has argued that “silence is an underutilized concept in game music”, and that “hearing something too frequently lessens its value” (Vreeland 2013). Allowing the music to take a backseat also allows for other aspects of the game to become more prominent such as the visual art or the sound effects, which again adds depth to the game by not presenting a constant wall of music (Ibid). This lack of music also marks the game out as distinctive in a world in which it is common for games to have a constant layer of music.

3.3.2 Pitched sound effects

As mentioned briefly above, certain sound effects in the game also have a distinctive dynamic nature. *Fez*’s unique music engine enables the sound effects triggered when the player collects cubes and gains power-ups to be put into the game and made to sound in the key of the song currently playing. Each piece of music effectively has its own instance (or project) in Fezzer and the pitches of the cube-collecting sound effects were inputted into the music engine manually, most likely either by Vreeland or Bedard. A look at Fezzer’s visual interface (see Figure 11) shows how a user would input the pitch of the sound effect that would ‘work’ in a piece of music’s key. At the very bottom of the image one can see the drop-down boxes labelled “Shard Notes” which show where the user would input the pitch of the sound effects.[7] While this system works well for pieces of music that remain in one key throughout, the Fezzer for each piece of music is not able to detect key changes, a fairly prominent feature of Vreeland’s music for the game. It is therefore a system, as Vreeland argues, that “only works 50% of the time”. A system that works 50 per cent of the time, however, as Vreeland argues, “is better than having no system at all”. (Vreeland 2013). Refer to Audiovisual Example 10and 11 for examples of sound effects being pitched in and out of key.

[7] This term, "Shard Notes" is seen in Figure 11 and is slightly confusing as the term "shard" is never used in the game. It seems to be a term used between the developers of the game referring to the cube pieces that the player is tasked with collecting.

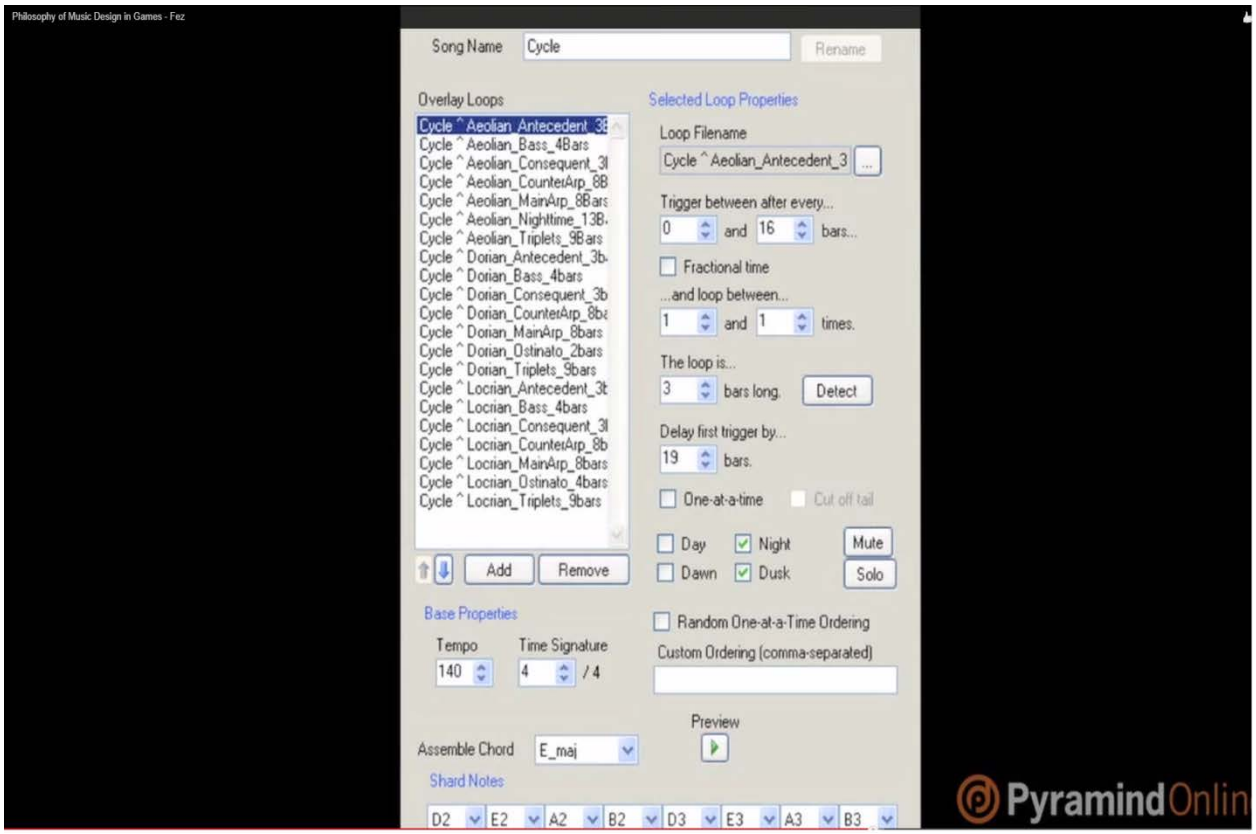


Figure 11 – Fez*'s music system for a single piece of music (Vreeland 2013)*

3.3.3 Puzzle music

Another area of the game that involves a unique kind of dynamic music is in the puzzle areas. On these levels, players find themselves indoors where they are presented with a multitude of different puzzles to solve. Vreeland says that he wished to mimic the idea of an old-fashioned jigsaw puzzle with music. To do this he determined the main elements of a puzzle are that they are made up of various interlocking elements that fit together, and so wrote music with "seven different kinds of instruments, each with their own part, and each part [with] a different [bar] length" (Vreeland 2013).

Using Fezzer, Vreeland was able to change the music depending on what time of day it was in the game, allowing him to create this piece in an interlocking fashion. In this piece each of the seven layers of music is written in a different musical mode and attached to one of the four game states – dawn, day, dusk and night. Therefore, depending on what time of day it is in the

game, the music will move through these different musical modes giving each time of day its own character. In addition, the music system allowed Vreeland to provide parameters for how many bars the program would wait before triggering the next loop, allowing for a random amount of time between each triggered loop and imitating the interlocking nature of a puzzle (in the context of *Fez*). To explain, as the piece unfolds the separate melodies lock-in with one another, but shift in tonal and harmonic quality and in a fashion imitating a traditional puzzle being put together. As the pieces of a traditional puzzle fit together and build a full picture, similarly the musical melodies in this area fit together and build into a complete piece of music.

On some levels of the game, the difference between dawn, day, dusk and night is visually obvious, however, the puzzle level is set indoors and so the player has no way of telling what the game state is. The only evidence of shifting states is provided by the shifting modes, which provides the level with its own uniquely adaptive music (see Audiovisual Example 12 for Vreeland's demonstration of these different assets at work).

3.3.4 Thunder and irregular music

Another area of the game that makes use of the game's dynamic music system is a graveyard area. In this area it is raining and flashes of lightning can be seen, appearing on the screen at random intervals. Vreeland explains that he wished to imitate the idea of a thunder storm with the music and make the music "actually sound like a storm as well as have the music['s] behaviour mimic what a thunderstorm would sound like, where you have a transient 'boom' and then you hear the rain and you are not sure when the next 'boom' will come" (Vreeland 2013).

The piece of music in this area is called 'Fear' and is made up of eight assets with each asset being a chord. These chords have a percussive element to them, with a hard attack that fades out with a trail of arpeggiated notes (see Audiovisual Example 13). The way the music is made to imitate a thunder storm is through the use of the music system: after each chord is played a random amount of time passes before the next chord is played, causing each chord to happen unexpectedly. The lightning (accompanied by the sound of thunder) seen on the screen is also programmed to trigger at random intervals. The resultant effect leaves the player unsure of

when they will be hearing the next chord or when the next lightning flash will occur, giving this area a feeling of uncertainty, and keeping the player on the edge of their seat.

This section has attempted to show the various ways music in *Fez* might be considered both dynamic and immersive, and I have argued that the game's music fits both Kondo's definitions of dynamic audio, and Huibert's understanding of immersion. To elaborate on Kondo's point, *Fez*'s music most definitely changes on each play-through, partially due to the non-linear nature of the game but also due to the random elements featured in the music. The music, such as that in the puzzle area, has "transforming themes" and certainly creates a "multicoloured production" (quoted in Collins, 2008). Both these factors add "new surprises and increase gameplay enjoyment" and increase immersion. Though *Fez* does not extensively add "musical elements as gameplay features", the use of pitched sound effects could be said to be using sound as a gameplay feature that becomes part of the music. There is also a hidden level in the game featuring musical gameplay, discussed below. This allows us to define *Fez*'s music clearly as dynamic. All of Huiberts types of immersion are also all present in *Fez*, most prominently *sensory* and *imaginative*-based but also including *challenge*-based.

Though these dynamic and immersive effects are achieved in the most part by the music system, Vreeland's compositional approach of using layered melodies and ambient soundscapes fitted well into the dynamic music mould. This, along with Vreeland's attempt to mimic what is happening on screen through his music, greatly aids in the immersive atmosphere of the game and is likely to have a positive effect on the player's experience.

3.4 Music and narrative:

One of the difficulties Vreeland says he faced when composing music for the game was "how to create a strong narrative with locational music in a non-linear game" (Vreeland 2013). It is worth unpacking Vreeland's statement here: by "locational music" it seems Vreeland is referring to music that is linked to particular areas of the game (a village area, a space area, a nature area, etc.), and by "non-linear game", Vreeland means a game in which players may plot their own course, playing the game's different levels in whatever order they chose. Vreeland's statement may appear odd to a player of the game not particularly focused on the music: the

ambient, dynamic soundtrack is certainly not obviously 'telling a story'. But a close examination of the music does reveal music to be operating in ways that might, very broadly, be seen as narrative, marking certain parts of Gomez's journey of discovery as significant, and making links between connected areas.

Vreeland's solution to the problem he perceives is to present the "big picture in the linear moments" (such as the beginning and the end of the game) and to "tell side stories everywhere else" (Ibid). He argues that "since [the player] is experiencing everything else non-linearly, not everyone is going to tackle those in the same way, [and so the composer] needs to try and find, in the individual sections, ways that you can inform the overall story" (Ibid).

To achieve this, Vreeland attempts to make the music of these linearly-experienced areas stand out as much as possible compared to some of the *more* ambient music on the soundtrack found in the smaller, "side areas" (the areas experienced non-linearly, after finishing the introductory section of the game).

3.4.1 Music and narrative in the game's first areas

To return to the beginning of the game: after receiving your magical fez and special powers you return to the village accompanied by a musical cue called 'Home' on the soundtrack album of the game's music. The gentle, warm-sounding synthesizers playing upward-moving four-note arpeggio patterns lend the music a tranquil air (a transcription of 'Home' can be found in the appendix excluding the bass and drums). The use of chords that include the interval of a second and a fourth impart an unresolved 'hanging' quality that may be perceived as nostalgic. The piece has both a major and minor feel (though possibly more major-sounding) which adds to the general 'ambient' quality of the music. The nostalgic, almost narcotized quality of the music is also the result of a fairly large amount of soft digital reverb that has been applied to the synthesizers used for the introductory arpeggio patterns and for carrying the melody line (refer to Audio Example1 – 'Home').

Structurally, the piece features two sections, section A in which the chords move generally downwards in pitch, feeling more relaxed and then section B where the chords move upwards.

Section B therefore creates more tension than section A and ends by modulating to C-major. This modulation is quite abrupt as the chord progression moves down a semitone (the kind of harmonic shift one might not expect in most ambient music) into the new key and seems to hint at interesting events to come. The music in this area is not at all interactive or adaptive and is simply to set a mood. As Vreeland states, his aim was to underline the significance of this 'home' area by having music that is more structurally composed than some of the ambient music featured in the side areas of the game. In other words, the piece has a definitive binary form (AB), a clear rhythmic pulse, moves away from a single tonal centre, and a well-defined melody (Vreeland, 2013).

The piece is 1:35 minutes long and loops on conclusion. After the first repetition, drums and bass are added, again creating a sense of depth and progression. The initial lack of rhythm also sets the peaceful/nostalgic scene at the beginning of the game as well as the general tone for the game as a whole.

In the area the player reaches immediately after the village, the music becomes more sombre. The cue, which Vreeland calls 'Reflection', is based on 'Home'; it uses the same chords, albeit with different voicings, and no longer any discernable rhythm (Vreeland 2013). This music is far more ambient in feel – with drawn-out synth pads, and no real sense of a pulse – and has a wistful and reflective quality, perhaps even a sense of loss as Gomez leaves his home village and sets out on his journey of discovery. The music ends after 4:55 seconds and fades to the ambient sounds of water (refer to Audio Example 2 – 'Reflection'). If the player returns to this area after he/she leaves here, 'Reflection' does not play again; all you hear is the sound of water. Vreeland argues this is because:

> [the player is] only ever going to be in this place, experiencing this certain mood once, where you are leaving somewhere you have always been for the first time… I saw that as an opportunity to do something beyond just writing locational music…I saw it as an opportunity to try and inform the story. (Vreeland 2013)

This idea of experiencing a piece of music only once to create an emotional link is effective and marks the departure from your village as a significant moment in the game.

The area the player enters next is a kind of hub: the final area of the game that all players will experience in the same order and to which players will return many times to find new paths to explore (Ibid). The cue Vreeland composes for this area is called ‘Compass’ on the game’s soundtrack album. Vreeland wanted the music to be bold and strong for this section, and wished to mark it as an important area due to the number of times the player may potentially return (Ibid). The synths here are far brassier in timbre, with a heavy saw-tooth drone on a low C running throughout, even while the key is distinctly G-major, evoking once again an unresolved, suspended quality, but far more fanfare-like than the previously heard music (refer to Audio Example 3 – ‘Compass’).

The three cues that make up this introductory section of the game create a kind of narrative thread for the initial phase of Gomez’s journey, with each of the three pieces conjuring distinctly different emotions. ‘Home’ is peaceful and nostalgic, ‘Reflection’ carries a sense of departure and slight sadness, and finally ‘Compass' is bolder, embodying a sense of endless possibility. Using a fairly narrow synth palette and a largely ambient musical style, Vreeland’s introductory music, rooted in the signifying musical conventions players almost anywhere in the world are likely to be able to read, functions narratively to position the player/Gomez at the start of an exploratory adventure. This kind of narrative musical capacity is evident also at the end of the game.

3.4.2 Musical-narrative links and ambience in *Fez*’s final section

In the interview I have been quoting in this chapter, Vreeland stresses that he attempts to create a narrative with the music in the game. In the section I will discuss a few areas of the game where Vreeland seems to be drawing narrative links and discuss whether or not this effect is evident in his often-ambient music.

One of these areas is the final area of the game where the player comes across an alien civilization. There is a piece of music attached to this area which Vreeland names ‘Majesty'. ‘Majesty’ is the music heard when Gomez discovers the populated village of an ancient civilization. There is a musical motif heard in this piece that is foreshadowed by the music the player would have heard in previous areas, particularly in the areas where Gomez discovers the

ancient ruins of villages. This motif that can be heard in both pieces, is defined by its movement of a perfect fifth and can be viewed below in Figure 10. The piece this leitmotif is previously heard in is called ‘Memory’, however this piece is played in a much freer fashion, (see ‘Audiovisual Examples 8 and 9 for reference of these pieces’). Vreeland’s attempt to connect the story through motifs effectively creates a sense that this moment has been experienced before but perhaps in a less prominent way than was intended. A problem here is that the specific relevance of the motifs heard in both the ruined villages and populated ones may be lost on some players who are not paying attention to the music or the backstory.

Part of the problem with the use of motifs or themes in ambient music is that, by the very nature of ambient music (melodies generally not distinct if present at all, timbres nebulous and ‘washy’, music that takes place alongside activities that might demand more of the listener’s attention), associations the composer may wish the music to carry could be largely ignored by the listener. This may well be the case with Vreeland’s score. For example the first iteration of the motif in ‘Memory’ is hard to discern initially as the piece has a very atmospheric texture and a free rhythmic feeling. The motif heard here is so subtle many players might not draw the connection between these two pieces or even notice the connection at all. Even I, as a musically-conscious gamer, did not discern the connection on my first play-through. In this case, the motifs are fairly strong and effective when examined closely in isolation, but in the context of the game, foreshadowing with music of this sort may be lost on some if not most players. That being said, the use of motifs certainly has the potential to create a subconscious connection between these areas and does not take away from the suitability of the music, even if the specific connection Vreeland wishes to draw may not be experienced by the player.

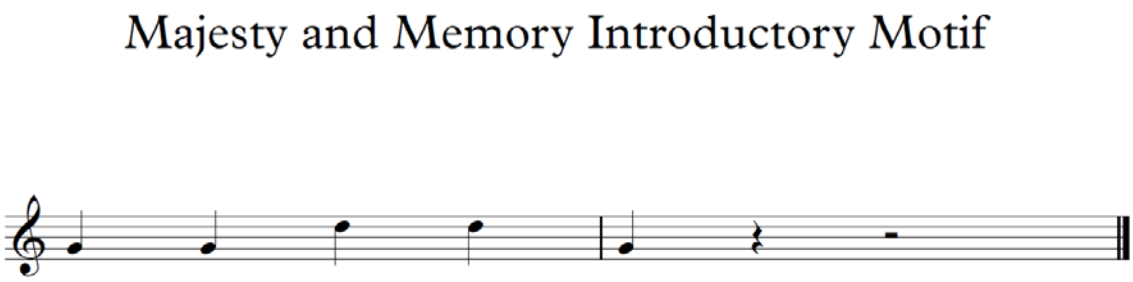


Figure 12 – Basic authors transcription of introduction motif from 'Memory' and 'Majesty'

3.4.3 Locational Music

One of the final pieces of music in the game, 'Beyond', is heard when Gomez goes through a large warp gate and finds himself in space. Vreeland describes the cue as more "sound-designy" than the other music in the game and features less defined harmonic and melodic structures (Vreeland 2013). In this area there is very little virtual gravity and no sound effects. When Gomez jumps he travels both a larger distance than usual and takes more time to return to the ground. The lack of sound effects and the music's long synthetic, gliding textures, its waves of pulsing sound, in this area create an enhanced sensation of being suspended in space and greatly aids in a sense of immersion.

There is also a secret area (available once the player fulfils certain in-game criteria) in the game where the player finds a room with constantly shifting tiles and platforms. These tiles are all taken from other parts of the game and rapidly change, obstructing the player's view of where he/she can safely move. Although this area does not feature dynamic music, the way the music represents what is happening in the area is worth noting. As the area around you shifts, displaying small parts of tiles found throughout the game, the music similarly built from the melodic, harmonic and/or rhythmic material from pieces of music found elsewhere in the game. This creates an effective immersive atmosphere once again as the music attempts to mimic what is occurring on screen.

Another example of locational music can be seen in the 'nature' area of the game. Vreeland states in this area during the day the music is intended to be "quiet and playful" and at night "the animals have come out to dance [and] feast" (Ibid). This is again done through the use of Fezzer, and different pieces of music are attached to the game states and give this area its own musical character. This is just another brief example of Vreeland's use of locational music in *Fez*.

3.5 Conclusion

In this chapter I have discussed the unique ways in which *Fez*'s largely ambient soundtrack creates a dynamic musical experience that results in a deep sense of immersion in the game. I have shown how music and sound are closely tied to the game's visual identity and how having a strong link between these elements of a game helps to increase a player's suspension of disbelief. I have also discussed the unique system (Fezzer) for triggering musical files that takes account of pitch and tempo. The main contributing element to *Fez*'s dynamic music and sound is the use of Fezzer which effectively allowed Vreeland to experiment with different ideas and concepts without having to send musical examples back and forth to the programmer before a decision could be made. The rapport built between Bedard and Vreeland also allowed for the music system to be constantly evolving to suit new ideas that Vreeland may have had for the game's music. The extensive use of a program like Fezzer greatly increases the dynamic nature of the audio in the game and in this chapter I have shown how the music is never heard the same way on subsequent play-throughs because of randomisation and the different ways it responds to the passing of time (game states).

This chapter also raises issues around the idea of narrative in game music, particularly ways in which ambient music might be said to narrate. Though there are problems that arise when discussing this topic, Vreeland on the whole, manages to succeed in this area. The way he achieves this firstly is through marking certain areas as more or less significant in the game with music. To do this Vreeland uses music that is far more ambient in the less significant areas and more noticeable in important areas. In this sense not all of the music in the game could be considered ambient. Vreeland's attempts at linking areas with foreshadowing and other kinds

of motivic material is also generally effective in creating a sense of cohesion within the game's narrative. That said, however, it is not certain whether *Fez*'s music would carry all the narrative information Vreeland might like it to. Finally Vreeland attempts to create particular moods/atmospheres for particular locations, giving each area a distinct musical character. This works well in the linearly experienced areas at the beginning and end of the game, and engages the player on an emotional level while supplying the imagined areas of the *Fez* world with suitable and unique musical ethnographies.

The chapter has attempted to show how music in *Fez* is strongly dynamic in nature. The techniques and ideas demonstrated by Vreeland and Bedard might be of use to other composers and game designers wishing to add depth to their scores and in developing new ways for video game music to be responsive and immersive.

Chapter 4

Musical Interactivity vs. Musical Autonomy in *Journey*

In this chapter I use the game *Journey* as a case study to investigate two functions of video game music that often appear to exist in tension with each other: dynamic music that interacts closely with the player, and autonomous music that has the freedom to develop over time independently of the player. The latter is what *Journey*'s composer Austin Wintory calls "music as a story-telling device" (Wintory 2012). For Wintory, game composers generally have to sacrifice one kind of music for the other, and he asks the question:

> [w]hich approach supports storytelling more? Is it going to be long, elaborate musical developments where the music is able to take on a life of its own, or is it in tightly interactive music, which bears little resemblance to traditional music? (Wintory 2012)

It is Wintory's contention that "neither extreme constitutes what [he] would call [a] dream game score" (Ibid). In my analysis of *Journey*, I will interrogate how effectively Wintory's soundtrack deals with two seemingly incompatible musical roles. I begin with a general discussion of the game.[1]

4.1 Context and personnel

Journey is a three-dimensional, adventure/platform game in which the player controls a robed figure with a trailing scarf travelling through an immense desert towards a distant mountain. While the game can be played online and other players may be encountered within the game world, you cannot compete with fellow players but only co-operate or continue on your own.

Journey was developed by 'Thatgamecompany' (TGC) for Sony's PlayStation 3 and was released in March 2012, three years after its initial development and over a year after it was intended to be released. The long production process, which bankrupted TGC, was due in part to what the game's creators put down to perfectionism: after the intended two year production process, the game was not "meeting the emotional peaks and valleys they had hoped to hit" (North

[1]As part of my compositional portfolio I also rescore some scenes from the game in an attempt to find different ways of approaching video game composition. My experience of this is discussed in Chapter 5.

2013). This gives some sense of the kind of game TGC were attempting to create. According to one review of *Journey*, TGC are known for creating games that are "meditative and quietly thoughtful works" which aim "to create an emotion in players" (Alexander 2012).

TGC's co-founder and the game's designer, Jenova Chen, addresses the idea of affect in video games directly, arguing that his company regards "emotion as nutrition […] and a healthy human should have a wide variety" (Chen quoted in Alexander 2012). For Chen, *Journey* is "something of a response to an age in which pursuit of accessibility has meant that any information is Google-able, hints abound, and goals and sub-objectives are stamped with flashing beacons" (Ibid). He concludes: "the problem with entertainment at large today is that I think there's a lack of wonder" (Ibid).

In an interview about the game with game reviewer Kevin VanOrd, Chen uses the image of an astronaut seeing the earth from space to describe the sense of awe and wonder he wanted the game to instill in a player: "a sense of small" (Chen quoted in VanOrd 2010). Elsewhere, Chen has said he wanted "a game that would inspire a feeling of loneliness in the player, but also a sense of poignancy, and a kind of stark beauty" (Kuchera 2012). This approach to game design differs greatly from the competitive and/or goal-orientated approach to game design more commonplace in AAA games where the player is generally made to feel empowered and competitive. In popular contemporary games such as the *Call of Duty* franchise, for example, the player is given weapons and the power to change the world in which they find themselves, and to fight against concepts such as terrorism or a generalised evil. In *Journey*, the aim for the player to feel powerless and small runs counter to the "typical defeat/kill/win mentality" one would find in titles such as *Call of Duty* (Gera 2011), and, in this, demonstrates what Lipkins considers a core indie value: "at its simplest, indie media is defined by what is not mainstream" (Lipkins 2013, 10).[2]

[2] When the player completes the game, the players he/she met throughout their journey will have their PlayStation Network identification displayed so that they can be found them online. The reason for this, according to the game's creator, is to discourage competitive play by keeping all players anonymous, therefore eliminating prejudice and creating a connection between players (Chen 2013).

Even though TGC had substantial financial backing from Sony Computer Entertainment who published the game, the game is still regarded as indie (it won Best Independent Game of The Year in 2012 at the Spike Video Game Awards).[3] This is likely related to the game's more philosophical approach and game design which has elements in common with the other indie games considered in this thesis, *Braid* and *Fez,* designed to give players a space to think, explore, and experience a range of emotions; an approach that could to some extent be thought of as part of an indie aesthetic.

Unlike games such as *Braid* or *Fez*, however, the team that worked on *Journey* was fairly large, consisting of a producer, multiple designers, two artists and a composer (who had his own arranger) amongst other personnel. The entire production team totaled eighteen people, much larger than most indie game development teams. In *Braid's* case, the team consisted of just two people.

4.2 A traditional narrative structure

Structurally, *Journey* is much shorter than the other games discussed in my case studies, totaling around two hours to complete and around five to six hours to accomplish all the games' hidden tasks. It is also, in certain important respects that impact on the game's music, far more linearly constructed: the player travels through various sections, in a set order, to reach the mountain which is the game's ultimate destination. For Chen the notion of the *monomyth*, an idea proposed by American mythologist Joseph Campbell, also known as the Hero's Journey, was an important structural frame for the game. Campbell identified a common narrative thread in stories and myths from different cultures and historical periods with the following three-part structure:

> A hero ventures forth from the world of common day into a region of supernatural wonder: fabulous forces are there encountered and a decisive victory is won: the hero comes back from this mysterious adventure with the power to bestow boon on his fellow man. (Campbell 1949, 24)

[3] *Journey*'s score was also nominated for a Grammy in 2012 for Best Score Soundtrack for Visual Media. Although it did not win, it is still marked as a historic moment as it was the first time a video game's soundtrack had been nominated for such an award (Pinchefsky 2012).

This archetypal narrative structure, while debunked as a common cross-cultural myth (Ellwood 1999), is common to many films such as *Star Wars* (whose director, George Lucas, credited Campbell's influence on the first *Star Wars* film in 1977) or *The Wizard of Oz* (1939) and is strongly discernible in *Journey*'s three distinct sections of gameplay (Bronzite 2013). In an interview with Keith Stuart, Wintory describes how the first time he met Chen to discuss *Journey*, they "had an extensive conversation about the philosophical and literary references in the game, especially Joseph Campbell's work" (Wintory in Stuart 2012).

Chen's use of an archetypal linear narrative structure for the game thus positions *Journey* closer to more traditional, non-interactive kinds of screen media than the other indie games discussed in this thesis, which impacts on the kinds of theoretical lenses that might be used to analyse the game. If game theorists such as Gonzalo Frasca and Espen Aarseth caution against the "colonization of game studies by theories from other fields", Karen Collins takes a more pragmatic position:

> Indeed, games are very different from other forms of cultural media and in many ways the use of older forms of cultural theories is inappropriate for games. However, there are places where distinctions between various media forms – as well as parallels or corollaries – highlight some interesting ideas and concepts that in some ways make games a continuation of linear media and in other ways distinguish the forms. (Collins 2008, 5)

To demonstrate how the nature and function of the music in *Journey* is similar in certain respects to other linear media, I will compare foundational film music theorist Claudia Gorbman's "Principles of Composition, Mixing and Editing", developed from analysis of classical Hollywood film scores of the 1930s and 40s, to the functions of the music in the game(Gorbman 1987, 73). Gorbman isolates seven important principles for music in classical cinema:

> Gorbman's principles of composition for narrative film music
>
> I. 'Invisibility': The technical apparatus of non-diegetic film music must not be visible.
>
> II. 'Inaudibility': Music is not meant to be heard consciously. As such it should subordinate itself to dialogue, to visuals – i.e., to the primary vehicle of the narrative.
>
> III. Signifier of emotion: Soundtrack music may set specific moods and emphasize particular emotions suggested in the narrative, but first and foremost is a signifier of emotion itself.
>
> IV. Narrative cueing:

> Referential/narrative: music gives referential and narrative cues, e.g., indicating point of view, supplying formal demarcations, and establishing setting and characters.
>
> Connotative: music 'interprets' and 'illustrates' narrative events.
>
> V. Continuity: music provides formal and rhythmic continuity – between shots, in transitions between scenes, by filling 'gaps'.
>
> VI. Unity: via repetition and variation of musical material and instrumentation, music aids in the construction of formal and narrative unity.
>
> VII. A given score may violate any of the principles above, providing the violation is at the service of the other principles. (Gorbman 1987, 73)

I aim to show in my analysis below how closely these functions line up with the functions of music in *Journey*.

However, while it is clear that certain aspects of *Journey*'s structure could be viewed as "a continuation of linear media" – a player is taken through the narrative 'beginning to end' in a similar fashion to the somewhat passive way a 'perceiver' (reader/viewer) would be guided by a narrator in a novel, or presented with a story in a play or narrative film – the game nevertheless involves interactivity and therefore in other respects, not least in ideas and applications for interactive music, as I detail below, *Journey*'s music is distinct from such linear models.

4.2.1 Interactive music in a linear format

Attempting to use "temporarily resistant", intrinsically-linear audio files in an interactive context is always going to be an awkward fit (Smith 2013, 1). Andrew Smith argues that we still lack certain technological advancements that would allow music to work fluidly in interactions with players in games (Ibid). His research which sets out to "illustrate the fundamental intractability of using recorded sound in interactive contexts", proposes that most game audio strategies "involve wide scale temporal fakery and myriad ham-fisted efforts to shoehorn static samples into interactive modes of operation" (Smith 2013, 82).

One tool Smith mentions for attempting to create fluid interactive music is through the use of middleware software such as FMOD Studio.[4] FMOD allows composers to input loops and audio

[4] Middleware is a general term for software that serves to "glue together" separate, often complex and already existing, programs (http://searchsoa.techtarget.com/definition/middleware). In FMOD's case, it is used to apply

files into it and then set markers and parameters that instruct the game when and how to use the music (in a similar fashion to Fezzer but with more complex controls). For example, take a loop that is two minutes long and which is meant to feature in an area that only has two minutes and thirty seconds of gameplay. Once the music finishes looping, a point can be set in the piece (using FMOD) so that it will continue onto the next loop at a specified point instead of at the end of the loop. This has repercussions for the composer as it means the music needs to be composed in such a way that it can continue onto the next section or loop at any point. Other options include switching the in-game music from one piece to another when certain events occur. For example, if a player encounters an enemy and the music needs to become more hostile, FMOD can be told to cross-fade one loop into another to change the quality of the music. This is a good example of the use of horizontal sequencing as discussed in Chapter 1. This means two separate pieces of music with similar structures but differing textures and dynamics need to be written that can be swapped in and out at any time. This kind of procedure works well for more ambient sections of a game, or for very modularized pieces of music, but is more difficult when applied to traditional kinds of orchestral (and other) music that have strong musical developments. Sony Scream is Sony's proprietary game audio middleware tool that operates in much the same way as FMOD, allowing for the seamless transition between loops and musical events, and the interactive elements of *Journey* were programmed with it (Lewis 2013). Wintory states that they "pushed the limits of what Scream could do on *Journey* and I could never have done any of it without the enormous contributions of Sony's team" (Ibid).

Programs such as FMOD or Scream are extremely useful compositional tools for creating tightly interactive music, however, the problem of attempting to fit temporally resistant audio files into an interactive context remain to some degree, as Smith argues, and as I show in my analysis of *Journey* below.

---

audio dynamically to a video game and would function between a DAW such as Cubase or Ableton and the game developer's software such as Unity or GameMaker.

4.3 Musical aesthetics

4.3.1 Instrumentation and aesthetic

-Macedonia Radio Symphonic Orchestra
- Solo instruments:
    - Cello
    - Bass flute
    - Flute
    - Viola
    - Harp
    - Serpent
- Electronic samples and synthesizers
- Percussion and tuned bells

Figure 13 – Inventory of Journey*'s musical resources*

Journey's soundtrack features a small collection of solo instruments that are heard throughout the game and a list provided for reference can be viewed above in Figure 13. The game also uses an orchestra as well as electronic sounds/synthesizers and recorded samples to create ambient drones and background music. Other instruments such as tuned bells and percussion are used minimally in the score (Wintory in Smith 2012). By far the most unusual of these instruments – and almost certainly its first appearance in a video game – is the serpent: a 17th-century bass wind instrument, seldom heard in contemporary music, that combines elements of woodwind and brass instruments, a brass mouth piece but side holes as well. The shape of the instrument is what gives the instrument its name, as it is large and cone-like but bent into a snake-like shape. The serpent has a dark and ominous tone and in *Journey* is generally used to represent more dangerous areas in the environment (see Audiovisual example 15 – *Journey*'s Underground Area and The Serpent).[5]

Although Wintory's soundtrack features a number of musically distinctive and expansive pieces of music, these are mainly heard in cut-scenes and a small number of gameplay areas. The music for much of the gameplay is on the whole extremely ambient and harmonically static,

[5] The serpent has featured in some notable film soundtracks including Bernard Hermann's score for *Journey to the Center of the Earth* (1959) and Jerry Goldsmith's *Alien* (1979).

allowing for melodies and pitched sound effects to be introduced and removed without causing dissonance. The music is constructed modularly to allow for this and also enables the music to continue to new sections without having to wait for the end of a loop. This is possible because of the largely static harmony Wintory employs; most areas of the game feature either a drone or synthesizer sounds that remain for the most part in one tonal area, and while there is sometimes a small amount of chordal movement, strong harmonic progressions are avoided during gameplay.

The general tone of the music is introspective: soft, sparse, often-electronic ambient soundscapes; generally in minor keys. A lonely atmosphere is enhanced by the melancholic melodies of the solo instruments, long, legato melodic phrases, and the use of the A-aeolian mode used for the only theme heard in the game.

4.3.2 The orchestra and musical interactivity

Sony's financial backing of *Journey* meant the development team had a large budget to work with. According to Chen, the budget was "multiple millions of dollars"— far in excess of most indie game budgets —and it is reflected in certain aspects of *Journey*'s production (Crossley 2013). One such aspect is that the soundtrack is scored for a full orchestra. Using a full orchestra is more common in AAA titles such as games from the *Call of Duty* or *Bioshock* franchises. While indie games on the whole do not have the budgets or requirements for orchestras, there are some exceptions: the *Shadowrun* games, for example, composed by Jon Everist, or *The Banner Saga,* which Wintory also scored.

The use of an orchestra has potential implications for interactivity — while some kinds of compositions for orchestra one could imagine working well as modular or loop-able pieces of music in a game (Erik Satie's modular score for the short film *Entr'acte* (1924), for example, or John Adam's *Shaker Loops*), symphonic 'cinematic' music with roots in the late-Romantic symphonic tradition, with strong forward-driving melodic phrases and harmonic developments would work less well in interactive contexts. In this chapter I investigate this kind of autonomous orchestral music that Wintory composes for certain sections of the game (often

cut-scenes) and compare it to the more ambient, easily modular music he writes for other sections.

Wintory also uses electronically manipulated recordings of the orchestra to create washy effects that fit easily into the synthetic ambiences of the gameplay sections. This is achieved by layering multiple string sections on top of each other, as well as by combining recorded and electronic sounds throughout the soundtrack to create ambient textures in the music (Wintory 2012). This can be heard clearly in the piece 'Nadir' (refer to Audio Example 4 –'Nadir').

The game's substantial budget and time spent in development also meant the producers could approach applying the music dynamically in a highly subtle and sophisticated way. For example, while Wintory's score is designed to loop in certain circumstances (which I describe in detail below), the seams are often extremely difficult to perceive.[6]

4.4 Scenes from *Journey*

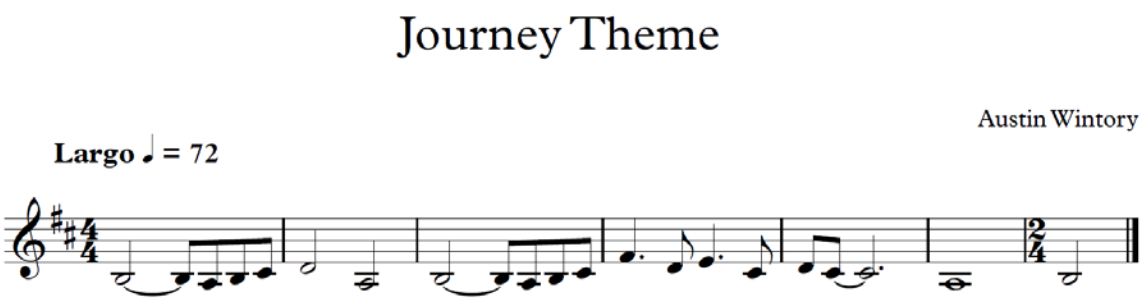


Figure 14 – Author's transcription of the theme from Journey

In this next section of analysis I will take four sections of *Journey* to show how aspects of the game's music work in the context of the game – three distinct areas in the game's desert area, and the concluding section of the game. The first area I discuss is the first area players will experience in the game: an expansive desert. Here I unpack musical operations in the game's

[6] There are exceptions when referring to pieces that have stronger or bolder musical sections and this point generally refers to the more ambient pieces in the game, which are more commonplace.

opening cut-scene before moving on to a consideration of how Wintory makes use of modular construction, looping and invisible trigger lines to introduce new music during the gameplay in this area.

Using this first area, I also consider Wintory's use of orchestral music and the implications for interactivity. My analysis of the game's first section concludes with an examination of the ambient music used to characterize the area and gameplay, along with a discussion of the game's sound effects.

4.4.1 Opening sequence

The game begins with a one-minute cut-scene scored for a mellifluous high solo cello playing the *Journey* theme on a bed of orchestral and electronic textures (see Figure 14 and Audiovisual example 14).[7] Out of a white screen we are shown images of the sun rising over the desert, stone tombstones, and a bright white light flying above the dunes. The simple melody is free-flowing with no sense of a strong pulse, but as we take on the perspective of the hurtling bright object, watching the dunes rush past beneath us, the orchestral and electronic textures swell in a dramatic crescendo which reaches its zenith and dissipates as the perspective changes and we are shown a robed figure set against the dunes – this is the player's avatar.

4.4.1 a. Cut-scenes

Journey unlike most other indie games, makes use of cut-scenes that serve as a narrative device to open up the game world beyond what the player can control. These cut-scenes are used to guide the player through the game, and to communicate narrative information. Music in these scenes operates entirely linearly, no differently to a film score. Cut-scenes are usually costly to make and as a result are not often featured in indie games. They are, however, a common feature of most AAA games. While cut-scenes often feature far more realistic, 'cinematic' animation compared to that which features in the gameplay, *Journey*'s cut-scenes are

[7] When Chen first met with Wintory, he asked him to write a musical theme to "help the team define the game" (Kuchera 2012). Wintory went straight from his first meeting with Chen and wrote the musical theme that became the sole theme in *Journey* (see Figure 14). Wintory is quoted saying that the theme "ended up being the foundation of the score" (Wintory in Stuart 2012).

presented in the same impressionistic, animated style as the game itself. However while the 'camera' in the gameplay is often positioned behind the caped character as it moves through the landscape, the cut-scenes feature greater use of different points-of-view. The use of cut-scenes aligns the development process of the game with a more conventional, filmic approach to the design process and narrative structure. This approach is taken in order to create a strong narrative arc within the game which both Wintory and Chen believe to be important (Wintory 2012).

4.4.1 b. Looping and triggers

After the introductory cut-scene, gameplay commences with the player given agency to move the character, who we see in a third-person perspective, along the desert floor. The post cut-scene silence remains if you choose to explore this area but you will quickly determine there is nothing but sand in the immediate vicinity and so you make your way towards a dune that is marked by two flags blowing in the desert wind.[8] As the player reaches the top of the sand dune a distant mountain silhouetted against the rising sun comes into full view, filling the screen, at the same time as the screen displays the game's title. As this occurs, a B-minor synch drone is triggered followed by the solo cello melody from the initial cut-scene, which corresponds with the appearance of the game's title (see Audiovisual Example 14). The appearance of this melody in both cut-scene and game-play serves to link the two, in much the same way as Gorbman's principle of Continuity provides formal and rhythmic cohesion – between shots and in transitions between scenes by filling 'gaps'. Here, instead of continuity between shots, music provides continuity between game-play and cut-scene. The melody (which recurs throughout the game) also has a unifying function in the score as a whole, just as Gorbman hears operating in classical Hollywood scores, "via repetition and variation of musical material and instrumentation. Music aids in the constructions of formal and narrative unity" (Gorbman, 73).

[8] If you do not head towards the flagged dune and continue to head out into the empty desert you eventually find yourself blown back by a sandstorm, represented visually and with sound effects.

Sparse and ambient music continues for the exploration of the desert that follows, with no rhythmic pulse; synthetic drones in B-minor, with an added 2^{nd} or 9^{th} (a C#) creating a slightly uneasy feeling. Occasional shards or variations on the *Journey* theme are overlaid by bass flute and cello in a modular fashion. All sound effects heard while collecting objects in this area are sounded to 'fit' in the key of B-minor, enabled, most likely, through the use of the Sony middleware platform, Scream.

If the player explores this area the music will loop after two-minutes-and-fifteen seconds. When the piece loops for the first time the theme is heard again on the bass flute, but, importantly, if the player remains any longer in this area the theme does not return. The lack of any new musical material once the area has been explored may be an audio signifier to encourage the player to move on from this area. This is a good example of music acting as a referential and narrative cue (see Gorbman's fourth principle).

This initial area of the game consists of loops made up of a minute of music to two-and-a-half minutes' worth of music as you explore. New loops or once-off melodies are then triggered by the player moving over invisible lines, reaching a landmark or encountering something within the game (see Figure 15). Sometimes sections of music will only play once then fade into silence. This is another example of the effective use of horizontal sequencing.

Below in Figure 11,Wintory shows in a basic illustration how the interactive elements of the game work in this opening section.

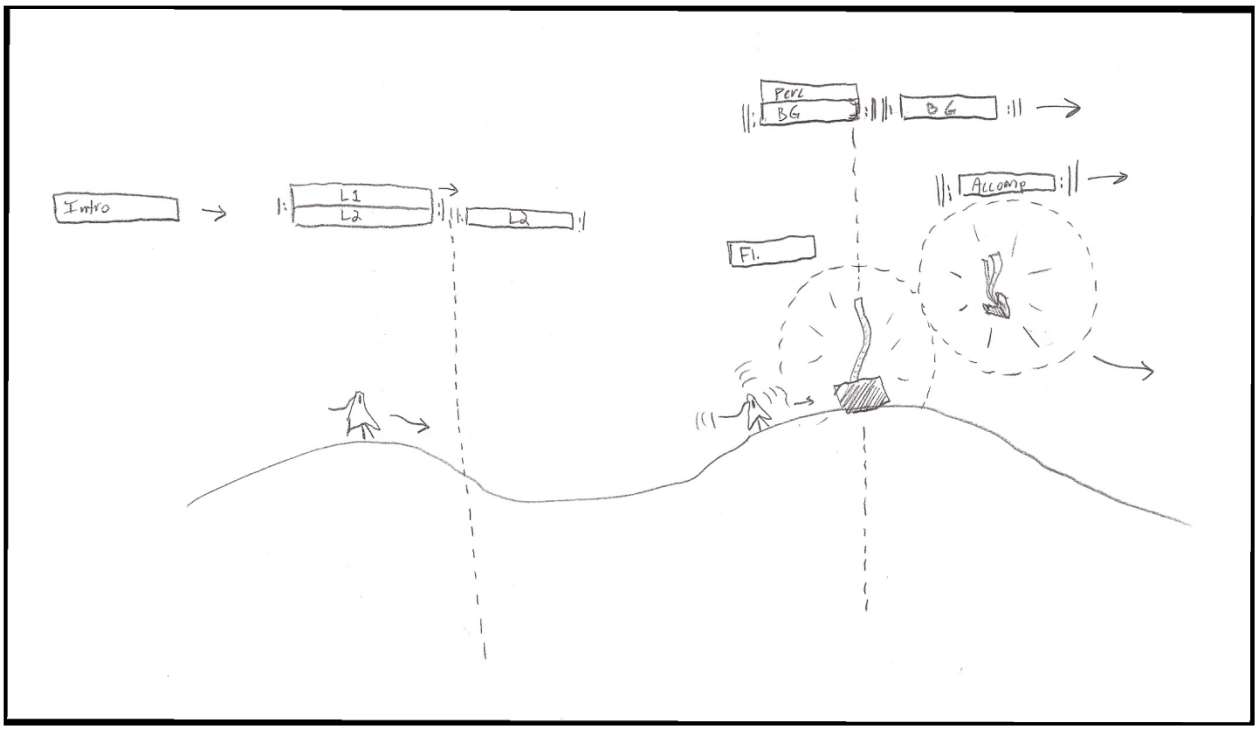


Figure 15 – Wintory's illustration of interactive music in Journey *(Wintory 2012)*

The rectangular boxes in the upper part of the image above represent different cues, chunks of audio (consisting of different instrumental lines and/or layers of music) that can cycle or loop, and which will be triggered when the player either crosses certain invisible lines in the area or interacts with landmarks.[9] It presents a useful example of a composer's use of both horizontal re-sequencing techniques and vertical layering.

Significantly even though the area is scored with small loops often lasting no more than two minutes, the looping always appears seamless. Another important aspect of the soundtrack, due to its modular design, is that shards of melody or sound effects can be superimposed on top of the piece at any time without conflicting harmonically. The modular and harmonically 'open' design of the music in this area allows for this seamless looping as well as the addition and removal of parts.

4.4.1 c. Ambient music and the orchestra

[9] Throughout the world of *Journey* non-playable characters (NPCs) are met. These NPCs are cloth-like creatures in the shape of fish that either guide your way or supply you with a resources that allows your avatar to float.

The game's initial desert area sets up a musical ethnography and general ambience for the game as a whole. It also serves to characterize the central figure, and to create a sense of unity with the recurring theme (in addition, it serves to provide continuity between cut-scenes and in-game play). In this, the game's music is functioning similarly to linear screen media. If we refer back to Gorbman's principles of classical film scoring they are as follows: invisibility, inaudibility, a signifier of emotions, narrative cueing (referential/narrative), continuity and unity. Most of Gorbman's principles line up with the functions of music in *Journey*. Signifying emotion and narrative cueing are integral in *Journey*'s score to create the strong narrative arc that both Chen and Wintory wish to develop. Continuity and unity are provided through the use of a single theme as well as generally minimal but unusual instrumentation. 'Inaudibility', a term Gorbman always uses in inverted commas, referring not to a *literal* inaudibility but rather to the idea that "music is not meant to be heard consciously", is also a good description of ambient music in many games. All the game scores referred to in this thesis have been ambient in nature and therefore may not always be heard consciously, but may often be "subordinate […] to dialogue, to visuals" or to gameplay (Ibid). Invisibility refers to the hiding of the "technical apparatus of non-diegetic music", this certainly applies to most game scores where the source of non-diegetic music is unseen (Ibid).

Another notable aspect of this opening section of the game is that the music is most interactive when the orchestra is not present in the score. For example, the orchestra is heard most prominently in the first cut-scene and when the *Journey* game title is displayed. When the player takes control over the avatar, the music is more ambient allowing for interactive elements such as the transitioning of loops or the adding of additional melodic parts to be possible. For the most part, this area of the game features both music with strong harmonic development and forward-moving musical momentum (a dramatic *crescendo* in the cut-scene) as well as interactive music (music featured during gameplay), with the orchestral music used primarily for the static, narrative areas of the game and the more ambient music for the sections where the player has control.

4.4.1 d. Gameplay and sound effects

While playing the game (assuming one's console is connected to the internet) other players may join the game at any point and help one along the way, revealing hidden secrets or a correct path. These players cannot talk or type to you but can communicate through "chirping" noises that are made up of "a combination of animals (mostly from various real birds), flute, cello and electronic sounds" (Wintory in Hamilton 2013) (see Audio Example 5 – *Journey*'s Chirping Sounds). These chirps can be expressed at three different intensities: soft, moderate and loud. These tones also undergo a transformation as the game progresses, becoming less bird-like and more human-sounding by the end of the game. The chirping sound is transformed as the game progresses, gradually incorporating a recorded human voice into the sound effect sample (Wintory 2012). Significantly, the chirping sounds, which contain a pitched element, always 'fit' the key of the music heard at any particular time. It could be that different sound effects in different keys were created, perhaps a few individual pitches, which the Sony Scream audio engine selects depending on the key of coinciding music.

4.4.2 After the bridge

I now move on to analyse the third area of desert featured in the game in order to show the seamless modular design of Wintory's gameplay music that doesn't appear to loop but shifts and changes as the player moves through various sections of the area, aided by the use of static harmony. This area also provides an example of the progression of instrumental tone in the game and how Wintory uses different instruments to give different areas of the game distinct tonal colours. It is also an area of the game Wintory says was most time-consuming in terms of composition: "The open desert following the bridge-connecting area, is what I spent more time on than any other in the whole game" (Wintory in Hamilton 2013).

4.4.2 a. Instrumentation and modular design

In this area the serpent is featured for the first time in the game, and as the music begins it contributes to an eerie, ominous atmosphere (see Audiovisual Example 15 – *Journey*'s Underground Area and The Serpent). Shortly afterwards, the bass flute and harp join in, adding a lightness and playfulness to the musical mood. The harp becomes more prominent in this area, playing a constant wash of notes. The bass flute can also be heard playing the theme as

the player enters this new desert area and sporadically over the background of harp and electronic sounds. Viola can also be heard in this area for the first time. As the player releases a larger cloth-like creature from the ground, flute and cello begin to play a duet that is a variation on the main theme. This is the only track in the game that employs all five soloists and as such it functions as a bridge between two different sets of instrumentation: connecting the initial use of bass flute and cello to music featuring harp, viola and serpent. As a result, music in this area is particularly densely textured, thinning out as the player moves away from the start of the area.

A consistent F# drone runs through the piece, made up of a combination of the serpent and electronic sounds. The music is initially rhythmically free, but a pulse is introduced with the entrance of flute and cello. The music then becomes fuller and more playful. As the player reaches a small ruin the music becomes softer and the flute and cello less busy. Though it might at first appear that the music is working interactively here, winding down as you approach the ruin, even if the player does not follow the cloth creatures to the ruin, the music still reaches this wind-down point before moving onto a new section.

The synchronization of music with on-screen events only works if the player follows the in-game cues, which presumably most players would do. My experimentation with *not* following the in-game cues, however, demonstrated that music here is not responsive to the player's movements.

Finally, as the player leaves the ruin, the music seems to fade and another harp part begins in a similar fashion. This brings our attention to a cross-fade, where the two loops used are overlapped allowing for a more developed musical piece. In this case, the loop seems to be similar if not identical to the harp underscoring used in the duet and solo sections. It would seem the loop is the same piece of music with the solo parts removed. While this does provide some kind of musical development, the piece never moves away from the F# tonal centre.

To conclude this the analysis of this area: though loops are reused in this area and not all of the music is pulse-less, the modular design created by the underscore of harp wash, serpent and electronics allow solo instruments to be added to or removed from the texture without causing

tonal or formal dissonance, and allow for a much more seamless experience when playing the game.

4.4.2 b. Melodic cohesion and immersion

In this post-bridge desert area the game's melodic theme is expanded and moved into the dorian mode with the soloist adding D# and E-natural notes to their phrases (see Figure 16). The dorian mode adds to the playful feel of the music, taking it away from the darker aeolian sound.



Figure 16 – Author's transcription of the melody of 'Threshold'

The single recurring musical theme and relatively unusual instrumentation creates a sense of connection throughout the game, unifying the score as a whole, and the music has a hypnotic and immersive quality. All these functions of the music aid in the immersive quality of the game allowing the player to be drawn into the game and its world. Gorbman's description of music in classical cinema making us less critical subjects, less aware of ourselves so that we become thoroughly immersed in the depicted world, and more responsive to its emotional arcs, applies equally here (Gorbman 1987, 73).

4.4.2 c. Instrumental tonal arcs

Continuing with the same area, new loops and solo parts are added as the player releases more cloth-like creatures and at these points the music becomes more complex and rhythmic, a

result enhanced by the use of the solo instruments. Once again as the solo parts conclude the music loops but without the additional solos added. As the player reaches a ruined tower the music changes completely becoming darker and slower with *legato* cello lines heard along with sustained strings. This last loop becomes extremely sparse and slow and breaks the pace of this piece slightly. Once the player encounters more ruins the music picks up once again until the player comes across a larger set of ruins in an area concealed by sandstorms. Once again at this point the accompanying music is slow and ominous with the serpent being heard prominently until finally fading to silence. The silence remains as the player climbs a tower to end the area. This is a great example of Gorbman's 'signifier of emotion' principle in classical scoring, which states:

> Soundtrack music may set specific moods and emphasize particular emotions suggested in the narrative, but first and foremost is a signifier of emotion itself. (Gorbman 1987, 73)

What can be noted again is that the area contains a mostly ambient soundscape in F#-minor, while shards of solo melodic lines are added to create a sense of musical development and to signify important narrative events in the story (such as when the player releases the floating fish-like cloths from the ground, or reaches the sandstorm-swept ruins). Without text or dialogue cues, music is required to do the narrative cueing, perhaps to an even greater extent than Gorbman outlined for classical Hollywood, and is more akin to music's role in 'silent' film, compensating for a lack of dialogue.

Another important aspect to note is that this area contains music with little in the way of musical development, which allows the modular design to work. The more forward-moving orchestral, 'cinematic' music (that draws on the 19th-century Western symphonic tradition), appears to be less suited to interactivity in video games; more ambient and/or modularly-constructed music appears more suited to such contexts.

4.4.3 Sliding desert sequence

The final area encountered in the desert is a sequence where the player slides down a large, steep sand dune accompanied by music. I will begin by discussing the general musical aesthetic of the area and how the music attempts to mimic what happens on screen. This area is one of

the first to feature the orchestra more prominently and is useful to show the effect of a film music-style orchestral music on musical interactivity. It is also a section I re-score in my own portfolio.

The music in this area is highly energetic, making full use of the orchestra. In this scene the music features melodies that move upwards and downwards in pitch quite rapidly, seemingly imitating the motion of your avatar as he glides down the sand dune, hitting small inclined ramps that send him flying into the air (see Audiovisual Example 16 – Desert Sliding). These musical events are not closely synchronized with players' actions, however, and the music seems to simply mimic the energy of what is happening on screen. The music also makes use of small sections that either repeat/loop or continue onto the next small segment until the player has crossed certain parts of the area. The music is in the tonal centre of E-minor. Once again there is no extensive harmonic movement and the piece remains broadly in E-minor. This section of music is the most rhythmic in the game, with hand percussion complementing the fast-paced feel of the area. This more up-beat music is necessary after such a long section of dreamy, tranquilizing ambience.

4.4.3 a. 'Cultureless' music

Though *Journey*'s music features instruments more commonly associated with Western music, Wintory's score as a whole and this section of the game in particular, has a somewhat 'oriental' or traditional Chinese feel to it. This is communicated through the use of sliding tones on the bass flute and the flute, as well as in the pentatonic flute and harp melodies. The occasional use of parallel fourths and fifths also contribute to this sound. Wintory has said that even though the game's visual architecture has a variety of influences (the specifics of these influences are unknown) he wished to:

> [g]radually [eliminate] localising concepts from the score [and] make it as universal and culture-less as possible. Inevitably there are fragments but by and large, I just wanted to make something that felt right, without needing to justify any choices based on references to cultures. (Nofi 2012)

Reference to non-western musics, and musical 'orientalisms' in particular, are fairly common in game scores, as mentioned in Chapter 2 on *Braid,* and Wintory's comments

are worth unpacking here. Though *Braid*'s music was not composed for that game specifically, the game's aesthetic also attempted to be culturally non-specific, drawing on music and visual styles from a variety of sources. Although Wintory believes his music to be cultureless, he is clearly channeling certain signifying properties of music, drawing on with signifying tropes of a mystical, mysterious, spiritual 'East'. There is a sense in which Wintory's use of such clichés comes across as stereotypical. While Wintory might argue he eliminated any sense of localised music, he is nevertheless drawing on a set of 'exotic' representational tropes. This is certainly an issue that could be dealt with in far more depth in an ethnomusicologically-centred study of video game music; suffice to say here that it would appear composers of video game music do not always take into consideration the implications of using 'exotic' or 'world' musics in their scores, and seem somewhat insensitive to cross-cultural context and issues of power and ethics in these kinds of musical representations.

4.4.3 b. Looping cinematic-style, orchestral music and asynchronicity

The full orchestra is heard again more prominently in this desert sliding sequence and begins to appear more towards the close of the game. As the player slides down the hill (see Audiovisual Example 16 – Desert Sliding) it would appear that the music progresses seamlessly, however, the descent is divided into small loops that will repeat until the player crosses certain points in the area. If the player chooses to stop, the music will loop indefinitely, however if the player goes with the intended pace of the game and continues down the hill the music plays without any sections repeating. This is significant as Wintory has managed to create a sense of autonomous music in this area that develops over time but is limited in the extent that it can interact with the player.

As the player slides through a sand waterfall and reaches a small plateau in the hill, a short cue is heard before fading to silence. As the player releases some larger cloth creatures the music continues to play but is less dense and at a softer dynamic. As the player leaves the area and continues their descent a new loop begins to play returning the music to its original rhythmic, upbeat mood.

This is potentially an area where the music is asynchronous, by which I mean the music may not always sound with the images it is intended to accompany. As the player reaches a tunnel in the sand dune the music becomes softer and slower; much of the orchestra drops out of the texture leaving electronic samples, synths, solo cello, harp and percussion. The string section then returns but the tone becomes somber, in contrast to the initially rhythmic-upbeat music in this section. This sequence of music is intended to link with a panoramic view of the desert and mountain, with sunlight shining through a number of pillars (see Audiovisual Example 16 – Desert Sliding). If the player chooses to stop their descent or take more time with it and not reach the view as the music reaches this peak, signified by the ascending cello melody and the crescendo in the orchestra, the music will lack close synchronization. The strong harmonic progression, with a strong sense of forward movement and musical development, will not have the required effect if the music is not allowed to unfold naturally, (for example if the player intentionally hinders their progress causing sections of music to repeat/loop). It is difficult to make modular, trigger-able sections of music from music that develops in this manner. To return to Smith's point of forcing inherently linear music into interactive contexts, the pitfalls of it can be seen very clearly here. To expand on Smith's point, what can be noticed here is that certain music may be inherently *more* linear than others. Most players will not hinder their progress willingly down the slope, however if a player chooses to explore the environment or take time to look around, the music will lose synchronicity with the events on screen. Using less orchestral/developed music might have meant it was easier to create more closely synchronized music, but the effect created by the orchestral development is hard to replace (my attempts at this can be seen in Chapter 5 and videos of my attempts can be found in my compositional portfolio found on the accompanying flash drive).

This brings us back to Wintory's initial statement about making music which can be interactive and also support the storytelling. Though the use of the orchestra and Romantic period-style orchestral arrangements are emotionally moving, the use of traditional orchestral music does limit the options for interactivity.

4.4.3 Finale

I use the concluding section of the game set in a snow covered landscape, as a further example of how modular design and the use of repeated material conflict with the cinematic-style, forward-driving orchestral music. I consider Wintory's concept of *narrative* music– music that narrates or tells a story –and how it relates to what is happening on screen.

The final section of the game finds the player's avatar trudging through snow accompanied by short swelling phrases of rapidly-bowed strings that play in an almost cacophonic manner in a swirl of ambient synth effects. As the player continues through the snow, music fades out into nothing but the sound of footsteps through the snow as the avatar moves more and more slowly before finally collapsing onto the ground. A cut-scene follows that shows several white-robed figures and a heavenly light that the player then flies up towards as the orchestra crescendos. The avatar is shown finally emerging above the clouds with the mountain now in close proximity. The cut-scene begins with soft synth pads in the key of A-minor over which the bass flute plays tranquil phrases from the game's main theme. As the glowing scarf flies through the air towards a white light, the strings play upward-moving, rhythmic figures, swelling with the synthetic sound effects, gaining in momentum and rising in pitch and volume until out of a white screen a new area is revealed and the player can once again control the avatar. Here the string section begins to play a short rhythmic, yet melodic, pentatonic phrase moving from B-minor to A-major and back, and is quickly joined by cello and viola which I have transcribed in Figure 17. This repeated figure is then developed, however, the tonal-centre never moves too far away from B-minor.

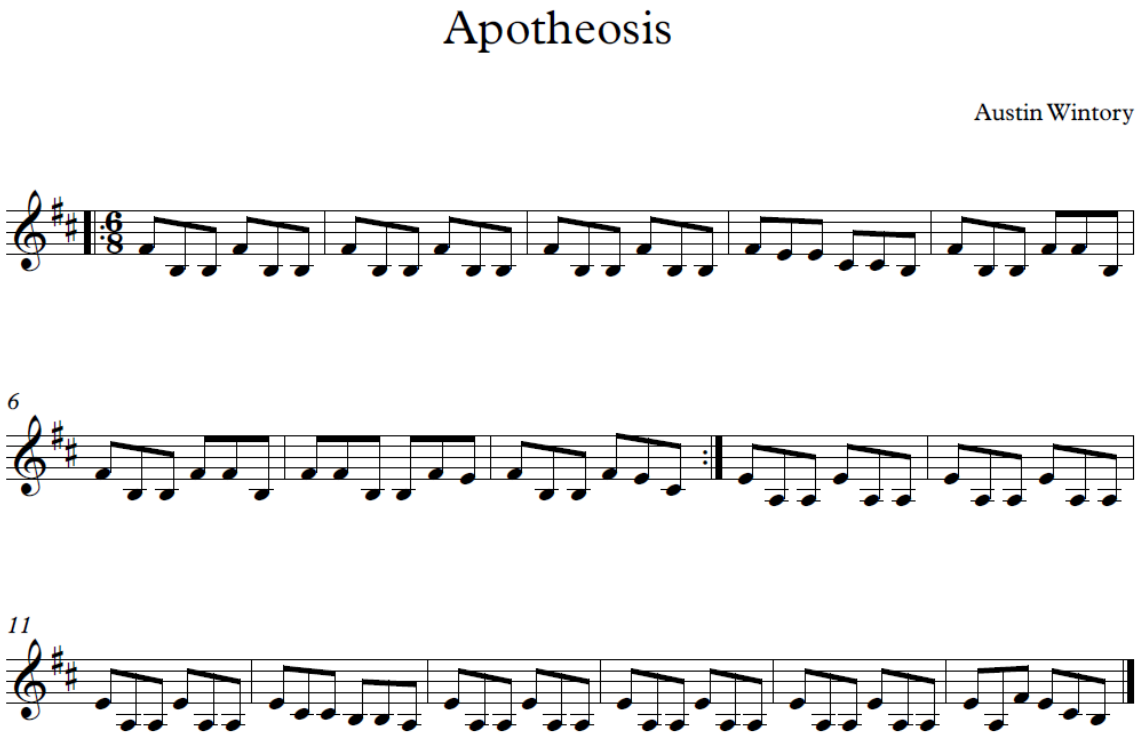


Figure 17 – Author's transcription of the introduction of 'Apotheosis'

4.4.3 a. Narrative and Musical Arcs

This area is made up of small repeated sections of music that last between fifteen seconds to a minute that neatly flow into each other. Each part also loops in a way to sound natural and at first a player may not notice when a part loops. This is due in part to the consistent melodic phrase that is repeated through most of the section. The player can float indefinitely in this area and if he/she follows the signs (non-player characters that guide your path up the mountain) then the music will hardly loop at all, continuing onto each new section smoothly. The level of interaction is high here if the player follows the in-game signs, as the music will unfold naturally and piece by piece as the player moves through area. Merely following in game signals may not seem to be highly interactive but it does allow for a constant shift of music/moods that seemingly change as you encounter different points in the area. However, to

someone wishing to explore the area or indulge in the visuals, the loop points might become clearer and possibly cause a loss of immersion and a lack of 'inaudibility' in Gorbman's sense.

As the player starts floating up towards the mountain through a beam of light (the player still has control at this point), the orchestra reaches a climax and as the player lands on the mountain the music decreases in dynamic and density and the melody on bass flute is heard again. It is important to note that the melody has now returned back to the original key, creating the sense of a full circle. This contributes to a sense of classical unity as we hear the original theme played in the original key as the game reaches its conclusion. Finally, as the player walks into a bright light, the original melody is heard on viola before fading to silence. What is clear in this area is that the orchestral music, with long melodic phrases, and a sense of forward-moving development (although it is still harmonically static), allows for the seams in the music to be more easily perceived. Though the strong forward moving developments heard in the music in this section transition smoothly from one to the other and can be considered modular as they move from one part to another in a cohesive fashion, the forward moving developments featured make the loop points more noticeable and therefore seem to break the immersive quality of the finale. This is mostly likely due to Wintory wanting to create a more emotive, musically-expansive experience for the end of the game rather than an interactive one; however, there remains a tension between the more expansive orchestral music and interactivity.

4.4 Conclusion

Wintory's goal to make music that is both interactive and narratively driven is realised in *Journey*, however the problem of one kind of musical function needing to be sacrificed for the other still remains. The at-times filmic, compositional approach to the game's music is effective but also limits the potential of the game to be more closely interactive. That being said the use of modular design in the music, enabling parts to be added and removed, is an example of effective, original, interactive, dynamic game music. Just as the backwards/forwards music/gameplay mechanic in *Braid*, and *Fez*'s use of randomized elements provide ingenious

solutions to long-standing game music concerns, so *Journey*'s modular design offers composers a useful model for creating truly engaging game music.

Chapter 5

Composing Dynamic Music: Reflections on the Production of My Own Composition Portfolio

My creative practice as a composer has been informed by the ideas I have engaged with in the preceding chapters whilst also informing my analysis of how other composers and game designers have approached the challenges of creating dynamic music. In this chapter I reflect on my own compositional process in a brief consideration of each of the pieces of music I have composed over the period of study. I provide background information and scrutinize the technical musical elements that make up each piece, highlighting significant compositional aspects.

Individual works that make up my portfolio exist in a number of different forms:

- as scores (full scores presented from page 120 of this thesis);
- as standard audio files (presented in .wav or .mp3 format on the accompanying memory stick);
- as music in completed games (including audio mixes of the music composed for the games, the game itself and/or gameplay videos on the accompanying memory stick);
- as videos of a re-scored pre-existing game (sections of the game *Journey*, also on the memory stick).

The overarching unifying concept running through my portfolio of works is their potential or actual application as video game music, and in the compositions I deal with many of the concepts I have considered in the preceding chapters: dynamic audio, ambient music, locational music, narrative music.

While a fairly large part of my portfolio exists as linear audio files, I use this chapter to outline how I have designed the music to be interactive and adaptive. The primary focus of my creative work for this thesis has been on the conceptual and compositional techniques around interactivity and dynamic music rather than on their realisation in the coding of so-called

middleware software like FMOD. That said, my submission also contains examples of these processes (such as cross-fading and layering of different audio files) having been applied to my music – see my 'Music for five short games' – and, in 5.8 below, I discuss how the audio files I delivered to the game's programmers were put to work dynamically in those games (albeit on a fairly basic level).

On the whole, the compositional methods discussed in this chapter are not the final steps in the search for fully dynamic music, but rather stepping-stones for future studies and compositions.

5.1 'Eno the Truth'

'Eno the Truth' is a part-improvised aleatoric piece written for solo piano that explores issues of bi-modality and ways to compose music that will be unique with each performance. Although it is not in itself music composed for a game, the application of the piece and the compositional concepts it explores, are clearly applicable to the world of game music, conceived after the realisation that strong, forward-moving harmonic progressions can sometimes cause a loss of immersion if the progressions are cut short (refer to discussion of the use of forward moving, orchestral music in *Journey* in Chapter 4).

I decided to attempt a piece that did not stay in one key or modulate through keys but was essentially bi-tonal: two different keys played at the same time. The aim was for the piece to still have a sense of harmony, at times, and a fair degree of consonance, but to shift between diatonic and more chromatic notes. Rather than fully notating the piece I have produced a set of rules/limitations for improvisation for the player's right hand. This could be thought of as analogous to the musical rules a game designer could program into a game via middleware software, and is thus an attempt to demonstrate a kind of algorithmic music. In my piece it is the *player/performer* who is creating the melodic lines within the limits I impose, but the piece could be adapted into a kind of automated composition.

An example of the intervals used in the left hand for the piece can be seen below in Figure 18 in bars 1 – 8, in the key of C-major: intervals of major and minor 6ths played quite freely with *rubato* at the end of each phrase.

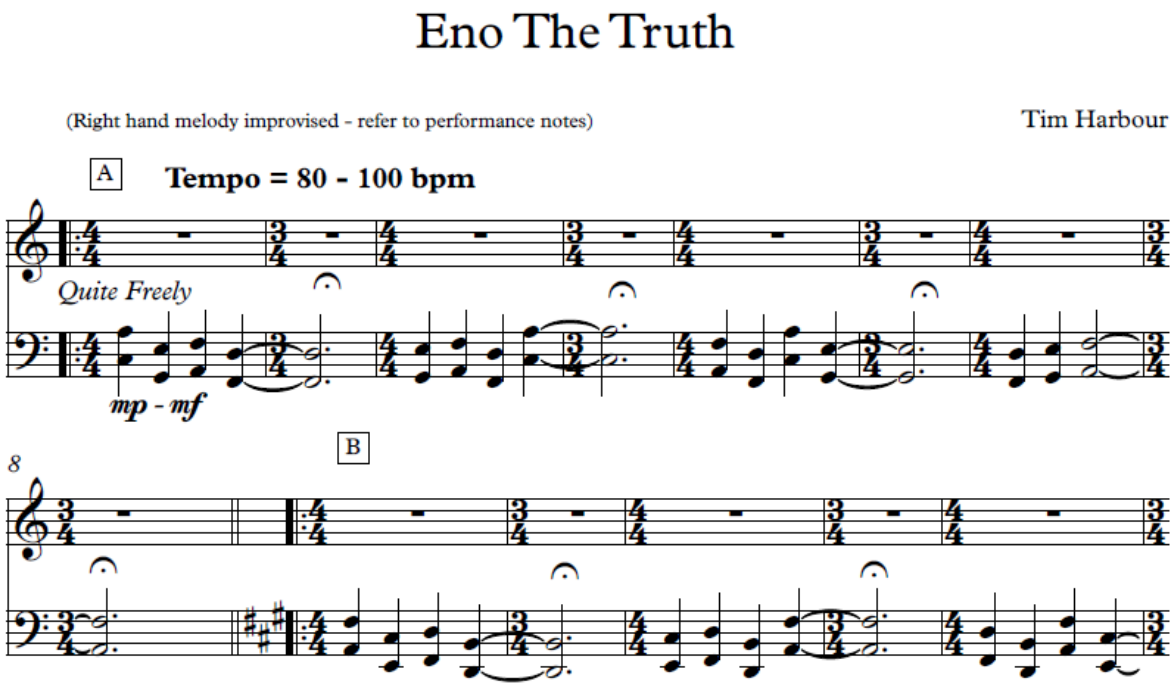


Figure 18 – 'Eno the Truth' left-hand intervals

In the first few bars quoted above the performer will play in the key of A-major with his or her right hand, beginning with only a choice of the shared notes between the C and A-major scales (the notes A, B, D and E). As the pattern repeats the performer begins to slowly add notes that are 'chromatic' in C-major but diatonic in the key of A-major. After the progression repeats the left hand plays the same set of intervals but in the key of A-major and the right hand improvises in the same fashion but this time in the key of C-major as can be seen in bar 9. In section C of the piece, shown below in Figure 19, a pulse becomes stricter and is scored as the chords of C-major and A-major played simultaneously from bar 17. There is still a slight elements of improvisation featured in the left hand, in Section C, and the performer is instructed to develop the left hand pattern shown in bars 18 and 20 as the section is repeated. The section may be repeated two to four times at the performer's discretion. Refer to the accompanying .wav at 3:26 file to hear an example of the part being developed.

The ending section is once again rhythmically free, and is one repeat of the first 8 bars without the improvised right-hand melody. From a harmonic point of view, the first two sections can be heard to shift slowly between diatonic and more chromatic pitches, with both section A and B

having a distinctive harmonic quality or character. This can also be heard similarly in section C where the basic triads are swapped between hands to create altered chords.

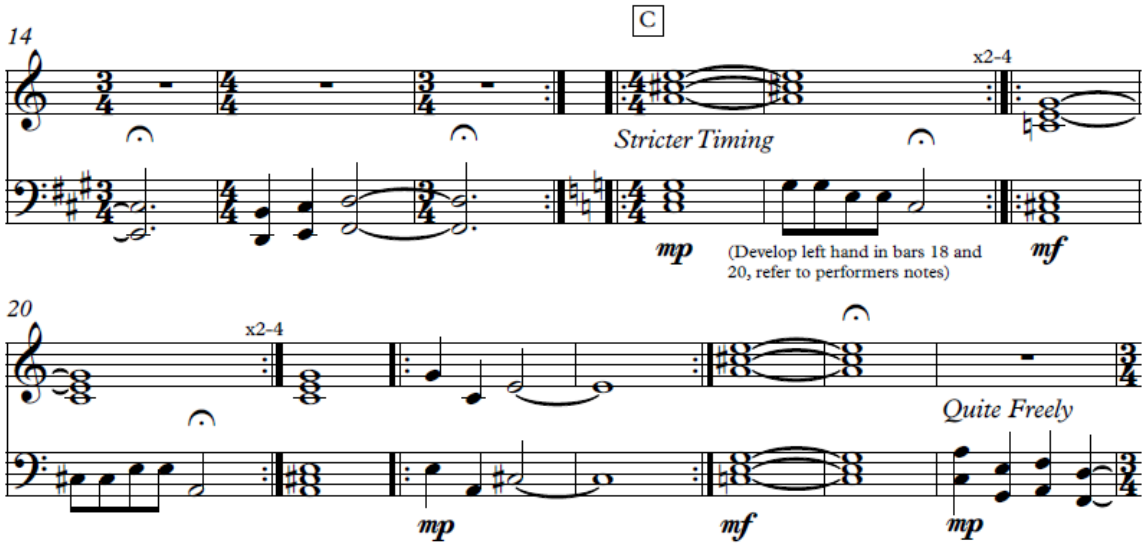


Figure 19 – 'Eno the Truth' section C

The concepts demonstrated in this piece may be used in an adaptive fashion in a game, as the ambient nature of the music and the removal of traditional harmonic structure would allow for the building and removal of tension and allow for melodies to be broken mid-phrase without causing confusion to the listener. A structurally-composed section, such as section C, could also be used to highlight a narrative event in a game, for example the section could be contained in a separate audio file to the rest of the music and be triggered when the character meets an important character or arrives at an important area in the game. This approach would work well in a horror game where the music can still present melodic content but also not be tied to one single key or rigid timing.

The recording provided was performed by the composer and is an attempt at portraying how the piece may sound in a single iteration.

5.2 'incommensurable'

This piece of electronic music exists purely as an audio file, with the scores provided transcribing just some of the parts heard in the piece.

This piece was inspired by Brian Eno's *Ambient 1: Music for Airports* (1978), and more specifically, Eno's application of the concept of incommensurability – something that has no common measure or point of comparison – to music. For Eno, incommensurable music consists of

> [various musical sections that] are not likely to come back into sync again. Your experience of the piece, of course, is a moment in time... So as the piece progresses, what you hear are the various clusterings and configurations of these six basic elements. (Eno 1996)

My piece, 'incommensurable', is similarly made up of a collection of musical sections/melodic phrases of different lengths that loop. Each phrase is composed as a set amount of bars and are generally made up of more odd numbers of beats in each looped part (11.5 beats as depicted in the first 3 bars of Figure 20, and 13beats as depicted in bars 1-3 of Figure 21) resulting in less repetition as the phrases seldom meet at a start or end point. The piece is split into two separate sections with two different tempi: one at 55 BPM and the other at 120 BPM. The first section is in the key of Eb-major and features four different parts that slowly layer on top of each other and then loop. An example of two of these layers can be seen below in Figures 20 and 21. Figure 20 begins at 1:04 into the attached audio file and Figure 21 begins at 1:16.

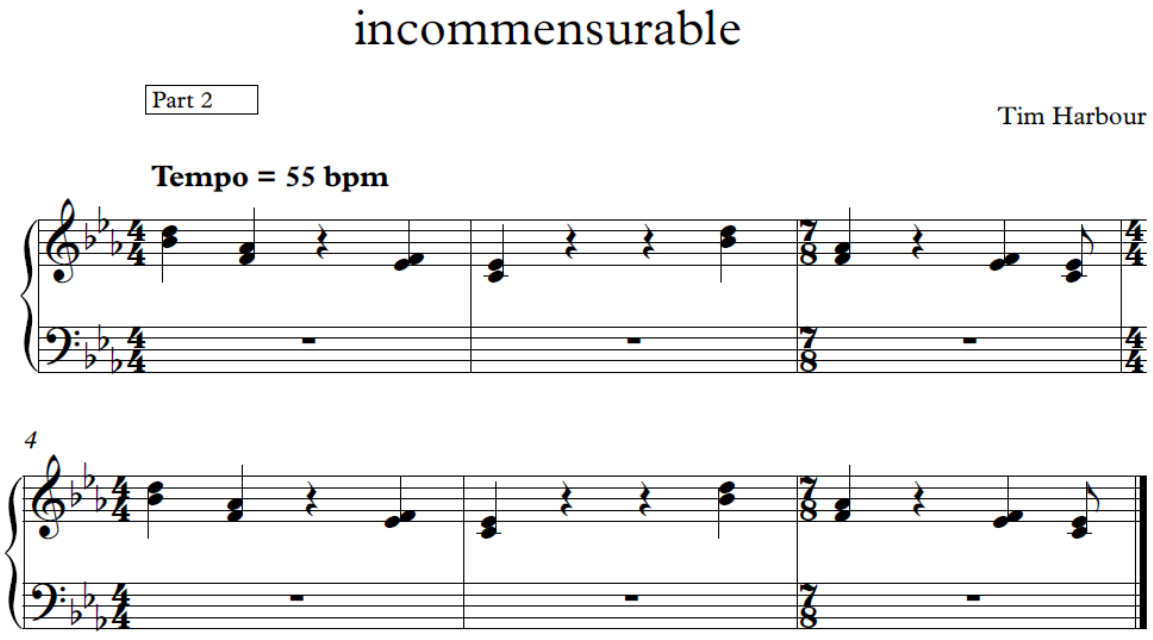


Figure 20 – 'incommensurable' part 2



Figure 21 – 'incommensurable' part 3

At 5:16 the piece moves to a second section that has more distinct minor sound and begins with the phrase pictured below in Figure 22.

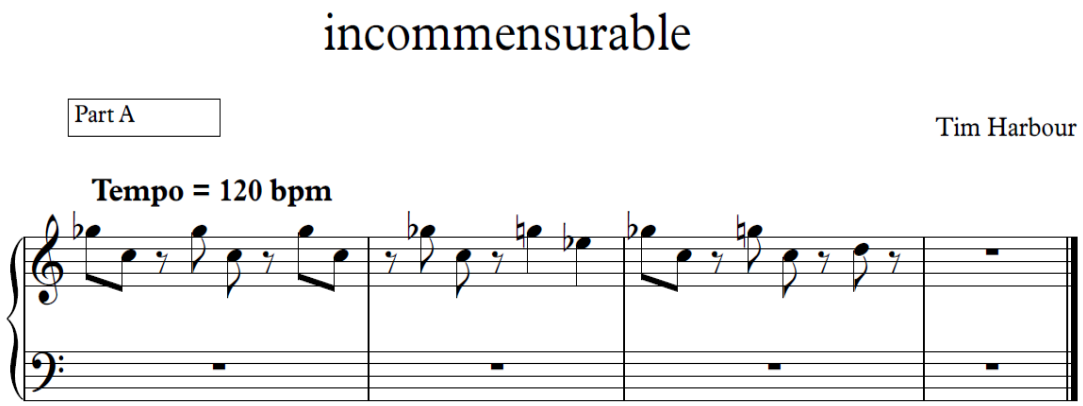


Figure 22 – 'incommensurable' part a

This section of the piece is in the key of Eb-major but uses the scale of C-harmonic minor and occasionally includes a Gb as can be seen in Figure 22 above. The piece builds and loops in a similar fashion to the first section of the piece and repeats until the end.

This method is not particularly interactive but could be used adaptively, with loops being introduced as certain narrative information is presented. The music can also intensify or become sparser to indicate different levels of danger in a game (such as when Part A is

introduced at 5:16). This piece also deals with the concept of looping and how to apply loops in a way that creates new sections as the music repeats.

5.3 'Spheres'

This piece exists primarily as a score, with 'mock-up' .wav files using sampled instruments provided to demonstrate what a performance of the piece might sound like.

'Spheres', written for viola and cello, uses melodic phrases to explore the idea that a collection of melodies, all written in the same key, could be combined in any order and still have a 'pleasing' sound. The piece is inspired by Boulez's experiments with controlled chance in 'Domaines' (1968), initially written for solo bass clarinet that developed into an ensemble piece. In this piece the performers have a choice in which order the sections of the piece are played, and the sections may be played in their original state or in retrograde, allowing the piece to provide a unique experience on each performance.

In a similar fashion (though far more tonal), my piece is broken up into multiple sections or spheres, each with their own character and collection of melodies. Each sphere has distinct phrasing and harmonic textures, and the form of the piece will be different on each performance.

There are three spheres in the piece, the first and second are both written in C-major but the first sphere uses major-sounding intervals and scales and the second more minor tonalities. Both spheres are phrased *legato* however the first is played *sultasto* and the second *sulponticello*. The third sphere is in the key of C#-major and still features a minor tonality but is to be played *staccato*. Examples of melodies from each sphere can be seen below in Figures 23, 24 and 25. As can be seen these melodies often feature larger intervallic movements and centre around the chord tones to help multiple melodies to fit together reducing the chance of dissonance.



Figure 23 – Section 1A from sphere 1



Figure 24 – *Section 2A from sphere 2*



Figure 25 – Section 3A from sphere 3

The performers are to prepare, for each performance, a new selection of melodies, and a new order for which the spheres will be played. Melodies can be combined in any way; an example of this would be combining the viola part of 1A with the cello part of 1C. You will only mix melodies that are from the same sphere but a cello part can also be used by the viola and vice versa. Melodies can also be played in unison. The performance instructions can be found in the accompanying composition portfolio.

This approach to composition will result in a unique performance on each occasion but the piece will still maintain a generally diatonic sound.

This idea relates well to video game music as this method would allow for a large amount of musical variety in a video game without having to use hundreds of recorded parts. In addition, multiple spheres could be used with each depicting a different area or mood in a game. Finally, spheres could be made to be more or less dense to represent different intensities of mood, and could function in an adaptive manner, characterising the current game-state with music.

5.4 Re-scoring Two Sections of *Journey*

This part of my submission consists of a re-scoring of two sections of the game *Journey* (also one of this thesis's primary case studies, discussed in Chapter 4). It takes the form of a video: a music-and-sound-effects soundtrack to a recorded play-through of the game. While my music for the game exists as linear audio in this submission, my intentions for musical interactivity in the composition will be made clear below.

My re-scoring attempts to find new ways of applying music interactively to the game by using small loops for underscoring and general ambience, while still presenting long-phrased melodic content that could synchronize with a player's actions. This approach to some runs counter to the original, almost cinematic approach that Wintory takes, with its strong sense of forward momentum and musical development.

Journey Overdub 1 - First Desert Sequence rescores a play-through of the beginning of the game, and features both more traditionally-composed sections and ambient sequences intended to be used in an adaptive manner. *Journey Overdub 2 - Sliding Desert Sequence* is a

rescoring from the middle of the game and shows a scene where the player's avatar slides down a hill and finds his way into a dark underground area.

Some of my ideas around applying music dynamically can be seen in *Journey Overdub 1*: while the introduction and end of the video are linearly composed for the cut scenes, the music in-between is modelled to work in an adaptive format. Once the player takes control at 1:26, short ambient layers of music will slowly build as the player reaches the top of the hill. If the player does not go towards that location the music is designed not to build, thus offering the player a kind of musical guide. As we are presented with the game's title, the music becomes an extended four-chord progression that plays out on pad-like synthesizers until 5:00 and does not loop. The melody in this section is rhythmically free and extends until the chord progression changes.

This extended chord progression also allows for certain chords to represent certain areas of the game such as around 3:30 in the video. Once the player receives his scarf the music will move to the next chord, emphasizing this important narrative event in the game. As the player returns to the desert the music becomes darker and rests on a minor chord until 4:40 when the player enters another small ruin area where the music returns to a major chord. At 5:00 a harp-like synthesizer enters that is designed to be triggered only if the player passes through the ruins and lights-up the inscription on the wall. Finally, the player reaches a collection of column-like towers just after the 5:00 point. The chord progression shifts in this area to represent a new area and the melody from the first area disappears. The removal of the melody allows for the player to explore and solve puzzles in this relatively small area without the music becoming irritatingly repetitive. Once the player completes the area, linearly-composed ending music is cued to accompany the cut-scene, almost as a reward for the player completing the level.

Another one of the concepts I explore in my re-scoring of sections of *Journey* gameplay is using short loops to build up the foundation of a piece while using longer melodic phrases over those loops to maintain a sense of forward movement and momentum. An example of this can be heard at the beginning of *Journey Overdub 2* (from 00:12) where a string section plays in a descending fashion when the player is moving down the hill and ascends when the player glides

off a ramp. My composition consists of multiple loops of the violin music (for the longer melodic phrases), playing both ascending and descending melodies that can be quickly cross-faded so that the music responds to the player's actions directly. The melody can be heard descending from 0:14 in the video as the player moves down the hill, and can be heard ascending at 0:26 as the player glides off a small ramp. Slightly different versions of both the smaller loopable parts and the longer melodic phrases could be written and triggered if a player chooses to take the left or right path as he or she slides down the hill, allowing for a more interactive experience.

In most cases multiple melodies and loop options could be written for one piece, and the melody could also be chosen at random each time the game is played to create a unique musical experience on each play-through. Melodies can be cross-faded to signify a specific emotion or mood-shift in an area, allowing the music to be both ambient and immersive, as well as having narrative relevance. For example, if the player reaches a dark area, a minor melody is cross-faded over the previous melody that also fits over the same loop. Musical sound effects have also been attached to objects in the game that can add unique musical elements to the score on each play-through depending on the player's actions. Examples of this in the video can be heard at 0:26, 1:41 and 2:12 as the player glides off ramps and under small arches. I have attached musical pitches or instruments to objects, such as these arches and ramps, so that they add to the piece of music as they are interacted with by the player. This will mean a player's agency will, to a degree, influence the music. My re-scoring of this section of the game seeks to solve what I considered unresponsive and un-dynamic music in the original; Wintory's music in this section is made from repeated musical material as you slide down the hill with the only dynamic element being that different loops are cross faded with each other as you pass certain points in the game.

5. 5 'Canvas'

'Canvas' is composed for solo piano and inspired by John Cage's 'In a Landscape' (1948), a meditative, modal composition for solo piano that involves sustaining the piano's resonances with both the sustain and soft pedals depressed throughout. My composition similarly makes

use of the sustain pedal – a kind of acoustic/non-electronic ambient music – but in a slightly different fashion, by keeping a single tonal centre and semi-consistent rhythmic pulse. The piece has a continuous and repetitive bass pattern that stays on C while the right hand moves through different keys. The bass part slowly becomes more rhythmically complex as the piece develops.

This composition is an example of a piece that stays in one tonal centre but portrays vastly different moods, as a player may move through many different areas in a video game. This method could be used in an adaptive way by having certain modes signify particular pieces of narrative information, or to allow for the music to change with changing game states such as day and night, changes of season or landscape (similarly to *Fez*'s use of locational music discussed in Chapter 3).

The piece is called 'Canvas' because I viewed it as a kind of abstract painting in the style of Jackson Pollock where a blank canvas slowly becomes filled with splashes of paint, creating an increasing density of colour. The piece starts off with a simple rhythmic pattern and low density of notes and slowly becomes more rhythmically complex as the texture becomes thicker.

5.6 *The Cluster Suite*

The Cluster Suite consists of two pieces, 'Wash' and 'Blind', and was inspired by Steve Reich's 'Music for 18 Musicians' (1978). Reich's piece of musical minimalism is derived from a cycle of 11 chords, with each section based on one of the chords. Both the pieces in my suite are composed with a similar method, using a sequence of chords and clusters of notes to build up sections of the piece.

5.6.1 'Wash'

This piece is written for synthesized instruments and can be found in .wav format on the accompanying USB memory stick. I create synthetic/8-bit timbres using the Ableton Live software sequencer to align with the sonic aesthetic of games like *Fez*, an element of nostalgia that is a feature of some indie games (nostalgia and *Fez*'s musical aesthetic are discussed in Chapter 3).

The cycle of chords from which 'Wash's melodic and harmonic content was derived can be seen below in Figure 26.

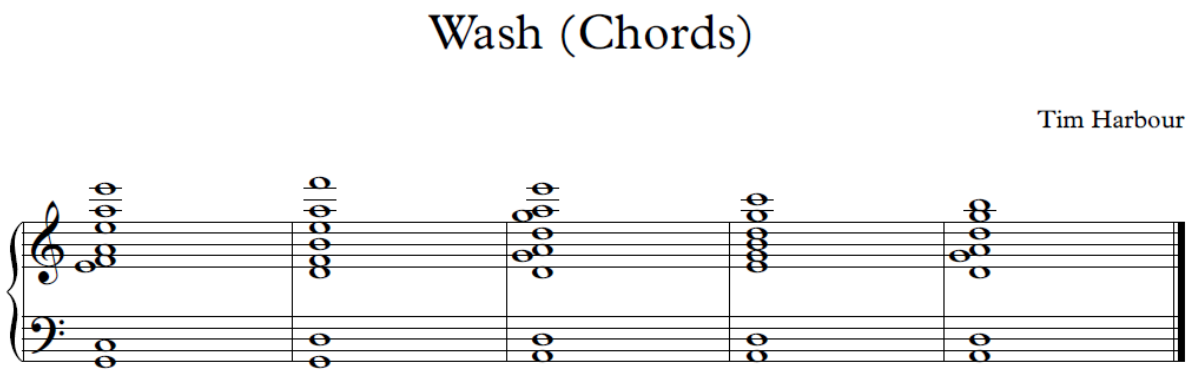


Figure 26 – Chords for 'Wash'

The first chord can be heard right at the beginning of the piece, sounded by just a few notes in the bass, but the piece begins to build in texture as another melody is added at 0:19. More melodic phrases are added until the chords change for the first time at around 3:17. The chord then changes again at around 4:17. From 4:22 the mood of the piece changes completely, introducing strong rhythmic phrases and the chord changes become more rapid, with the point of change becoming easier to perceive.

This music is envisioned to build up energy in a section of a game featuring large areas that require a sustained ambient soundscape. With this method, layers of music can be added and removed to create or remove tension, and the chordal movements can convey changes in mood or narrative.

This piece could be used adaptively in a video game in that each chord area could be used to represent an area of the game, a character or particular kinds of narrative information and then shift as the player moves from one area to another, or experiences a significant narrative event. The music could keep the same harmonic structure but also introduce new parts such as the rhythmic texture increase at 4:22 in order to indicate action or danger in the game. This compositional approach is also taken in *Journey Overdub 1*, discussed above.

5.6.2 ‘Blind’

‘Blind’ was composed in a similar way to ‘Wash’, however the piece is in a minor key and features more defined melodic content. The aim in introducing stronger melodic content is to allow a piece like this to be used as exploration music where the player may spend a few hours in the same area but still allow for the presentation of a melodic theme. This would be useful in a situation in a game where the player completes a primary task or makes a progression in the story. The chords from which ‘Blind’ is constructed can be seen below in Figure 27.

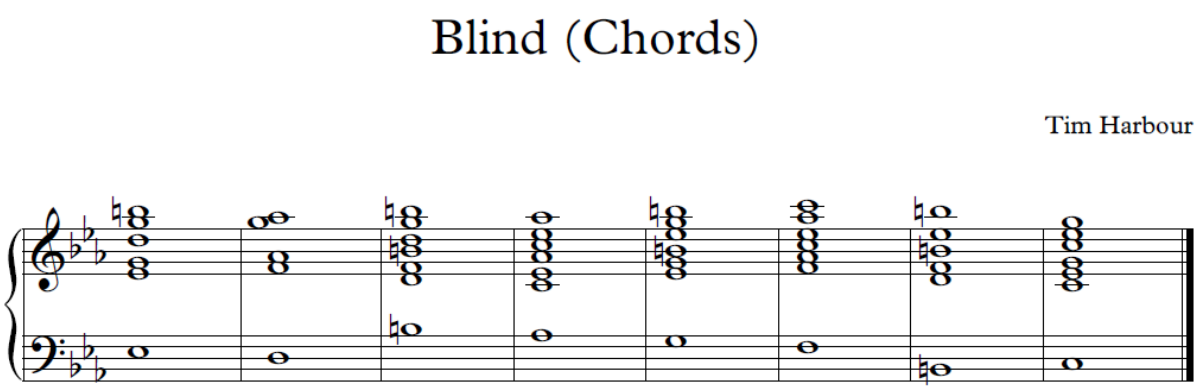


Figure 27 – Chords for ‘Blind’

The first chord is heard as the piece begins, here again with solo bass. The first chord change can be heard at 0:14 then another one at 0:25, and so on. The loop repeats at around 1:20 and more layers can be heard being added, building the chord over a wider frequency spectrum. This chord progression then repeats multiple times while layers continue to be added. At 2:42 a guitar melody is heard and is notated below in Figure 28.

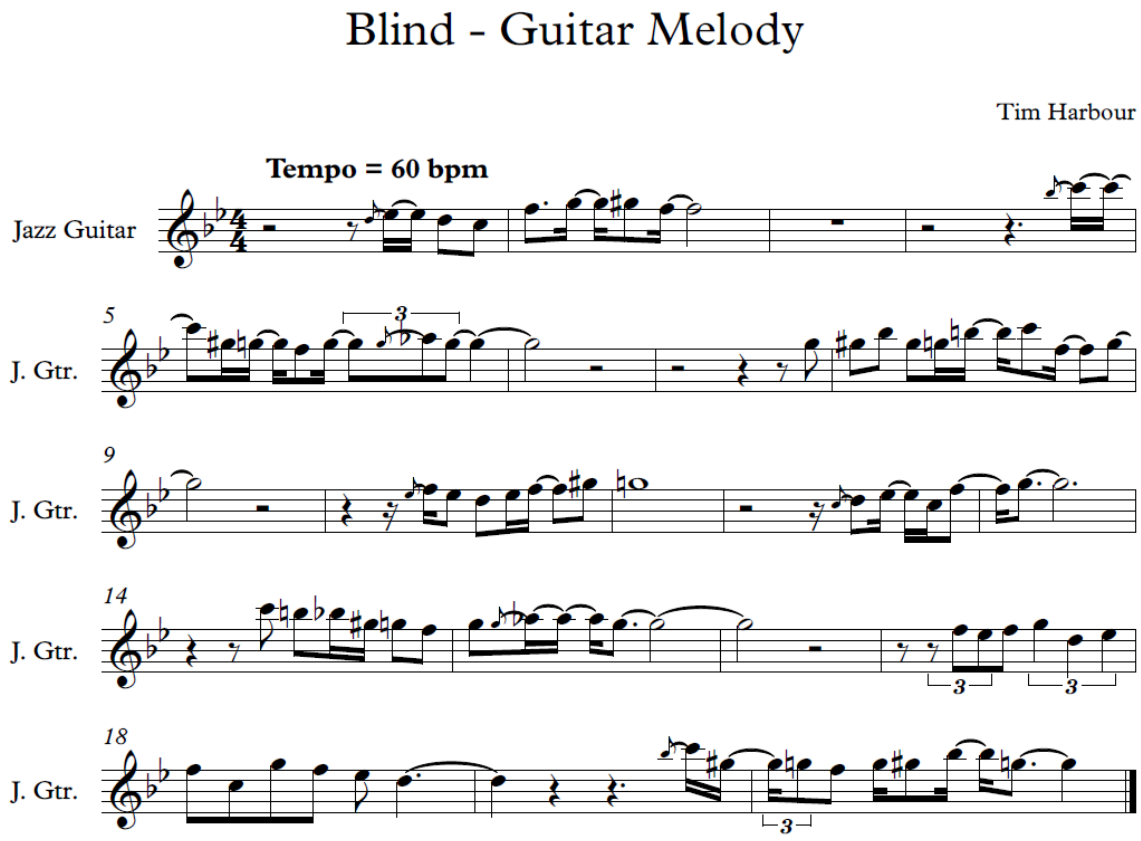


Figure 28 – Guitar melody from 'Blind'

The melody then repeats and is altered in various ways with multiple types of delays before being reversed at 5:20. The melody also becomes softer from this point onwards. The varied versions of the melody can be useful for foreshadowing – seeding the melody before its full and proper appearance, by presenting it in a different form. In the case of this piece, the reverse melody occurs after the main melody but could be used prior to the melody to foreshadow future events (foreshadowing with music is discussed in Chapter 3).

Although my submission of the piece here is in a linear format, in a video game single chords or a collection of chords could once again be used adaptively and be attached to game states, areas, or characters. This would ensure a player's choices would guide the way the music plays out instead of the music simply playing out linearly.

5.7 'Garden'

'Garden' is music for an imagined game and scored for a variety of sampled 'world' instruments – *ney* (a middle eastern flute) and *duduk* (an Armenian double-reed woodwind instrument) – double bass and percussion. The piece exists as a standard linear audio file, in essence a 'mock-up' of how the material could be organised in a game context. The piece is designed with three distinct areas in mind, with each area represented by a scale. The first area is written in the seventh mode of G-harmonic minor, the second area is based in F#-minor pentatonic and the third area is written in B-harmonic minor.

Each 'area' is made up of small, modular loops that can fit together and be removed at any time. The mock-up of the piece starts with percussion, which forms the linking music between areas. The initial percussion part can be seen below in Figure 29.

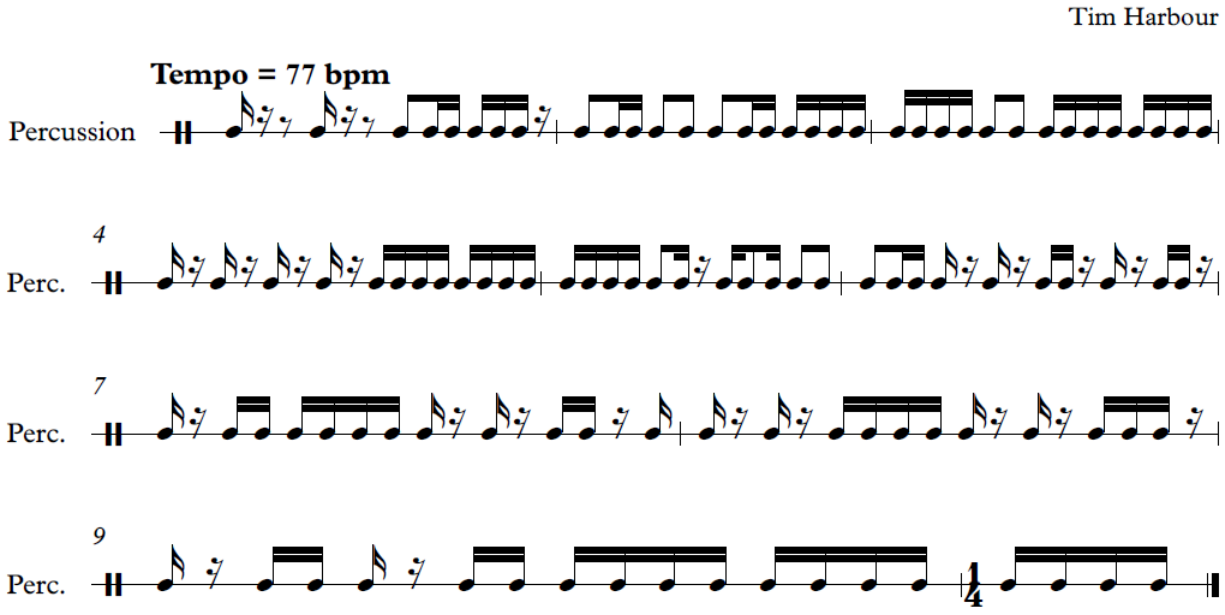


Figure 29 – 'Garden' percussion part 1

The drum falls silent after this initial statement, until the first section builds to a climax. The drums are used to start and end the piece as well as for transitions between sections in the

music and the imagined game. This method is used so that any of the sections can be quickly faded-out, leaving only percussion that can be used as bridging sections of music in the game.

This would be useful in situations where a player is transitioning from one area in a game to another, and creates continuity as a player climbs a set of stairs or travels through a passageway to a newly discovered area.

The first area is modelled as if the character starts in an empty space. As the player makes their way through the space, and interacts with new characters and objects, the layers begin to build up in the game, and certain modular loops or melodies can be attached to single characters or objects to create a *leitmotif* effect. The area starts with a melody played on the *ney*. Double bass is then added after one repeat and *duduk* after a second. Vibraphones are then added to the piece and then finally layers of percussion enter at 2:05 and at 2:37. The first section can be heard in its full form at this point. An example of the first four bars with all the layers combined (without percussion) can be seen below in Figure 30 and heard from 1:48 on the track provided.



Figure 30 – 'Garden' section 1

The drum transition begins at 4:10 and leads to the second area a player would arrive at in this hypothetical game. This area starts at 4:34 and the music begins as if the player arrives in an area that is already vibrant and busy. At 5:02 layers are removed to represent different narrative states, such as engaging in dialogue, going indoors or moving away from an important

area. More layers are slowly removed until once again all the layers reunite at 6:25 and play together until the second drum transition at 6:53. An example of the parts used in the first 4 bars of this section can be seen below in Figure 31 notated as they are heard at 4:34.

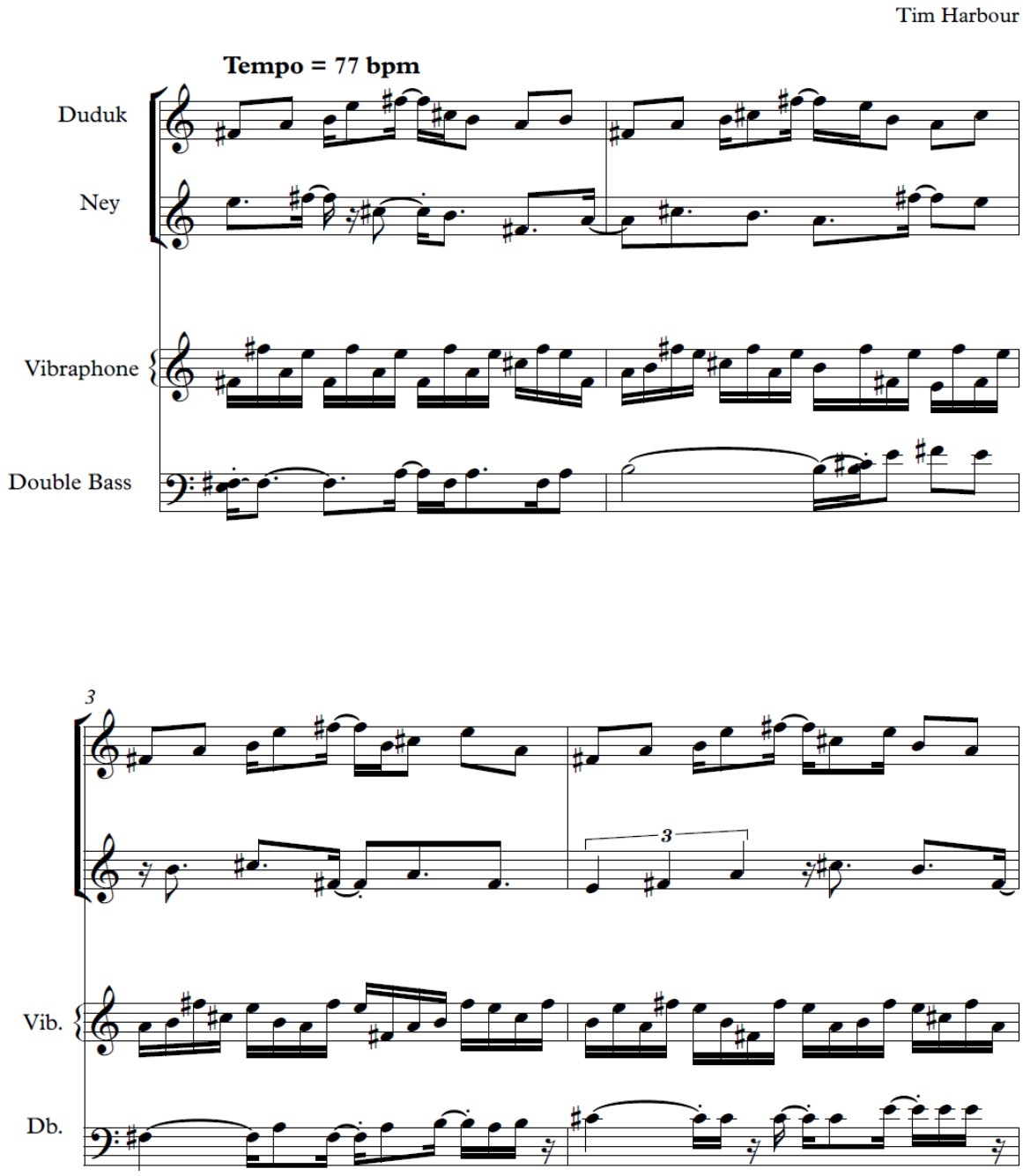


Figure 31 – Garden *section 2*

The final area starts at 6:56 and returns in a minor key as the character moves to a darker part of the story/game. It is modelled similarly to the second area and starts with all loops playing at once and are then removed and added to emulate a dynamic musical experience one might experience in the game. The first 4 bars of the music that makes up this section can be seen below in Figure 32.



Figure 32 – 'Garden' section 3

5. 8 Music for five short games

Each piece of music presented in this section includes a playable game for Windows – and/or Macintosh – based operating systems, along with video demonstration play-throughs of the games. The folder for each game on the accompanying memory stick also includes static audio files.

8.1 *Dead Run*

Dead Run is a mobile game that involves killing hordes of zombies to achieve as high a score as possible, and is a kind of 'endless runner' game. Endless runner games are a type of platformer game in which the player character constantly moves forward through a potentially endless, gradually-more-difficult world. They generally require only one button to play and have recently flourished on mobile devices. The aim is to progress as far along as possible before the player character dies.

The music in *Dead Run* is ambient in nature, and functions dynamically in the context of the game. The .wav file provided is a mock-up of how the piece could sound, but will not necessarily come out that way when playing the game. A short play-through of the game demonstrates this and is included in the *Dead Run* folder titled, *Dead Run Play-through* along with instructions to find and play the game.

When playing *Dead Run*, the game matches the density of enemies on the screen with the intensity of the music. This was achieved by writing multiple loops, some featuring less or more 'heartbeat' sounds that can be heard throughout the piece (individual loops can also be found in the *Dead Run* folder). The different loops either maintain a heartbeat sound at a constant rhythm or the heartbeat increases or decreases in rhythmic intensity with 'Dead Run 03 1 – 1' being the least intense of the loop and 'Dead Run 04 2 –3' being the most. In the video provided a loop can be heard crossfading at 0:41, and in the next loop that plays the heartbeat sound can be heard building in intensity as the video ends. Due to the density of the enemies being determined randomly, the music will also have a random element each time the game is

played. This piece is purely adaptive as it responds to the state of the game and not to the player's actions.

8.2 *Beat Attack*

Beat Attack is a time-based game where the player aligns coloured blocks in time with the music. The realised aim was for the music to increase and decrease in tempo during gameplay. It was difficult to make the music stretch and shorten in time with the gameplay, and as a result the music is broken into one-beat segments at various tempos and fired in time with the visual elements of the game. I had to therefore remove overlapping features in the music such as sustained notes or reverb and the music has to be mixed down at varying tempo so that the samples fit into the space provided. The tempos used in the game were 50 BPM, 70 BPM and 110 BPM.

My music is strongly interactive as the soundtrack responds directly to choices the player makes. It is also adaptive as the music continues to play in time with the events occurring on screen even if the player does not take any action. The sound effects are worth pointing out in the game as they were designed to complement the game's music and you can hear this happening effectively in the play-through videos provided. The sound effects often create a new melody as the player is breaking blocks in the game (such as can be heard at 0:22 and 0:26 as well as other places in the first video provided) and adds to the piece each time the game is played depending on how well the player performs.

8.3 *Sweet Dreams Bobby*

The single piece of music composed for this horror game is largely ambient and called 'Terrible Purpose'. It is used to create a dark and oppressive atmosphere for the game's environment. The game is set in an empty, haunted house, from which the player is attempting to escape while unseen monsters attempt to kill him/her. The player needs to avoid darkness while playing the game and stay close to light to avoid going crazy. A short play-through of the video can be found in the *Sweet Dreams Bobby* folder titled, *Sweet Dreams Bobby Play-through*.

The music in the game has no strict pulse or melodic/harmonic content and consists of a lower droning layer and an upper 'incidental' layer.

The top layer is made up of the unsettling and atonal sounds of sampled violin, piano, prepared piano and some soft synths. This piece is not necessarily adaptive or interactive but involves random factors that create tension. These random factors may or may not relate to anything specific on the screen but will work to aid in creating tension, and the random elements create surprises for the player. Creating a soundscape into which almost any sounds can be placed at various stages in the game offers potential for unique musical experiences every time the game is played.

8.4 *MechaCop 2875*

MechaCop 2875 is a platform shooter that is set in a post-apocalyptic, cyber-punk-styled future. The player takes control of a policeman trying to bring law and order to the surrounding areas.

There are three different game states, represented by music: 'passive', 'semi-fight' and 'full-fight'. For each I composed a different layer of music that can be layered on top of other layers or cross-faded between them. This provides the game with distinctive adaptive music for each game state. As the player moves through different scenarios the music will adapt and layer, allowing for the portrayal of both action and non-action sequences. This can be seen if the player moves to the right of the screen in the game provided and engages in combat with enemies (a video of this occurring is provided in the *Mecha Cop 2875* folder titled *Mecha Cop - Example of Audio Crossfading*). When the enemies are fairly far away the music featured is the 'semi-fight' music, heard at 0:13, as it slowly cross-fades with the 'passive' music. Then as the player gets closer to the enemies, at 0:21, the 'full-fight' music begins to fade in creating more tension and warning the player of danger.

8.5 *Harmony Bloom*

Harmony Bloom consists of three pieces of music for three game states that result in visuals of a blooming garden. The music begins simply and atmospherically and slowly becomes denser as the game progresses and the puzzle becomes more complex. The pieces are called 'Soil', 'Seed'

and ‘Plant’, and they build on each other in that order. The player can interact with a selection of seeds that make different musical pitches as they grow and need to be grown in small patches of ground to complete puzzles. The player initially can see the colour and hear the sound it represents, but as the game becomes more difficult the player has to figure out which seeds to use by sound alone. As the player completes each of the three sections in the area, more layers are added to the piece and the music starts to ‘bloom’ as the in-game gardens become filled with flowers. This can be seen in a short play-through of the game titled *Harmony Bloom Play-through*, and found in the *Harmony Bloom* folder.

The sound effects in the game were not created by me and due to the game being made for a competition over a period of just two days, there is a lack of cohesion at times between the music and sound effects. Every time a puzzle is completed a melody is played back to the player in the form of sound effects and this can be seen in the video provided at 1:38. In this example the particular melody fits fairly well with the underlying music, however, occasionally while playing the game the melodies can cause some dissonance.

Chapter 6

Conclusion

My written thesis has aimed to explore issues of musical interactivity in indie games. My composition portfolio has sought to explore these same issues through original creative work. Together, the written and compositional aspects to this thesis have existed during the period of study in a kind of dynamic tension, a relationship of mutual influence. In this concluding chapter I summarise what I have learned in both areas, and indicate where further research could be focused.

6.1 Case Studies

My case studies demonstrate how each of the composers I look at (or the developer, in the case of *Braid*), found their own solutions to the seemingly intractable dilemmas of using audio dynamically in interactive contexts. Across the indie games I analysed, I discovered that often highly creative and ingenious solutions, as well as some compromises, were arrived at in each game. 'Narrative music', music that told a story, was one common requirement in all three of the very different indie titles I considered. Another important function for music was that it should respond directly to each individual player's actions, at least to some extent. Finding the perfect balance between the two functions would represent an ideal game score.

Braid's music might at first seem to be the least narratively focused, however, how the music is tied to the gameplay mechanics helps create a sense of immersion and still works effectively as a dynamic score. *Journey*'s score is the most narratively-focused and at times works similarly to a film score but also manages to use modular design and subtle layering to create music that changes on each play-through. *Fez*'s score also attempts to present narrative information, however, music is closely tied to the player's actions and environment. The music helps to lose the player in the game world and seems to be the most balanced of the games I analyse in this thesis in terms of presenting a gaming experience that is both 'narrative' and dynamic. Notably, the game that presents the most tightly dynamic musical experience (*Braid)*presents the least narrative information, though this is not to say the game presents no narrative information through the sound world but it

is more concerned with making all the elements of the game (visuals, music, narrative, gameplay, etc.) work together. *Journey* on the other hand presents the most narrative experience but in so doing sacrifices, to some extent, a dynamic musical experience. *Fez* manages to find more of a balance between the two, but once again has to sacrifice one method of composition for the other. That being said all the games discussed manage to find their own approach for the application of dynamic music whether they use a more dynamic or narrative-based approach.

One of the important factors that aids in creating dynamic music is the use of ambient music and modular design (the vertical and horizontal approaches first mentioned in Chapter 1). The use of ambient music in designing music to work in a dynamic context allows for many different approaches in creating a score that changes as the player progresses. Ambient drones or drawn-out chord progressions allow for the use of modular design where music can be placed on top of the ambient layers to create an evolving composition. Ambient music that is more nebulous and features less rhythmic content also allows for smoother transitions from one musical part to another, or allows for parts to be cross-faded without risking a loss of immersion. Although a game like *Journey* presents a much more cinematic experience, and the music is stylistically closer to the music one might find in a film, this at times limits the interactive and adaptive capability of the music in order to allow the music to carry more distinctively narrative cues. In the case of *Fez* the game is able to produce a balance of both dynamic and narrative music through the use of vertical layering and horizontal re-sequencing, and then, through the use of locational music, to provide certain areas with narrative links. These methods are seen mirrored in my own creative work (refer to the pieces 'Spheres' and *'*Garden'). A game like *Braid* has all the music tied to the game mechanic and therefore is deeply interactive but is less able to present narrative information due to the music always responding directly to the player's actions, and generally not adapting to depict the narrative or the game's environment. The use of vertical and horizontal compositional approaches combined with ambient music might present an ideal method for being able to produce music that is both dynamic and has the capacity to present narrative information.

I will now summarise the conclusions from my analysis of each game.

6.1.1*Braid*

Braid offers a productive example of how to use licensed music in an original way. The music in this case was not composed specifically for the game, but sourced by the game's developer who was looking for music that was both relatively unknown and, rather than use commissioned/made-to-order music, appeared to mean something to the composer. The use of relatively unknown pieces of music allowed the music to pass as originally-composed music for the game, and thus presumably aiding the player in immersing him/herself in the game world. The way *Braid*'s music is connected to the gameplay mechanic (the game's interest in the non-linearity of time linked to the forwards/backwards flow of music) allows for the music to feel responsive at all times. The aim here is that the close synchronisation of music, concept and gameplay would allow for a greater degree of immersion for the player. *Braid* is a fairly rare example of a game with interactive music that is not specifically a music game (such as *Guitar Hero*); *Braid*'s music reacts instantly to the player's actions and does not respond at all to the environment. *Braid* also shows that having a close link between all elements of game design (music, concept, visuals, puzzles, narrative, etc.) can greatly aid the player in submersing him or herself in the game world – an imagined world that might appear to be a real, living world while the player is immersed in it.

6.1.2 *Fez*

In the case study of *Fez*, I discovered firstly that music was set to work to communicate narrative information, and secondly that the game makes use of mainly adaptive music. The struggle for composer Rich Vreeland was to find a way to make music that was both dynamic and able to tell a story. For the most part he was successful in his attempts to create a score with both of these properties. Vreeland achieves this by writing more ambient, modular music for the non-linear sections of the game and writing music with more defined harmonic, melodic and rhythmic identity for the areas that are more narratively significant. However, due to the limitations of the software (the inability of Fezzer to detect key changes) as well as the nature of fitting temporally static audio files into an interactive context, some difficulties remain unresolved. While Vreeland does come up with unique solutions through using modular pieces of music that are stacked onto each other over an ambient soundscape, it would seem that a balance between composing music

that can represent narrative information and music that can work in a dynamic fashion is still hard to achieve. My analysis demonstrates that the dynamic music in the game is a stronger element of the music than the music's ability to tell a story.

6.1.3*Journey*

Journey presents a stronger case for the binary distinction between narrative and dynamic music, and Wintory makes a distinction between these two kinds of music in video games. He feels that trying to apply music in one way will always be to the detriment of the other. Wintory's score has a distinctly narrative function in the game but that narrative function often falls away when applying the music in a dynamic fashion and vice versa. Wintory makes use of an orchestra in his score but also smaller ensembles, and uses these smaller ensembles to create modular-type music during the non-linear sections of the game. He mobilises the orchestra to underscore the more narrative sections of the game. The use of a 'cinematic' musical style, rooted in the kinds of harmonic and melodic developments of 19th-century Western art music, seems to work well for music functioning narratively/linearly (a sense of progression, forward-movement, emotional engagement),but limits the music's capacity to work dynamically. *Journey* provides a useful case study of a game that tries to create both a narrative and dynamic experience but the conflict between these two types of musical composition is often present and leads to more questions about how to mould these two seemingly incompatible methods into a whole. This would be a good topic for further research.

6.2Creative Work

One of my initial aims at the beginning of this project was to reveal the methods that composers use when composing music for video games featuring non-linear content. As much as I feel this has been partially achieved, my research has been more of an initial exploration of some compositional techniques and approaches to music in indie games; there is still much work to be done in this field to fully realise new and unique ways for music to be applied dynamically in video games.

My research and compositional process has made me come to realise that adaptive music generally feels more natural and works well to keep the player immersed in the world and

to accurately portray shifts in mood in a game world; that being said, certain games such as *Braid* use interactive music in unique ways, which allow for interactive music to feel as applicable as adaptive music. Looking at some of my own creative work, *Beat Attack*, for example, provides a completely interactive experience yet is unable to present narrative information with the music. This is due to the gameplay mechanic being tied to the music – in this game it would be difficult to work with the 'narrative' techniques of *leitmotifs* or foreshadowing discussed in Chapter 3.The music of *Mecha Cop 2875* or *Harmony Bloom* on the other hand *can* be seen to develop over time providing an evolving adaptive score and developing with the game's environment, as opposed to simply tightly matching the player's actions. Although these methods of audio application – interactive and adaptive – are not incompatible, they are rarely used simultaneously in games. I believe more research into combining these methods would be beneficial to finding ways to create a more fully dynamic audio experience when playing video games.

Though interactive music is just as important as adaptive music in games, sometimes it has the potential to feel 'cheesy': every action by the player matched by music or sound effects results in a kind of over-synchronization or 'mickey-mousing' that has the potential to break a player's sense of immersion (refer to the discussion of the *Journey Overdub* videos in Chapter 5).*Braid*'s tying of the musical elements of the game to the gameplay mechanic can effectively help to make interactive music feel more sophisticated, and though music games (e.g. *Guitar Hero*), have been doing this for a while, *Braid* is one of the few examples of a game not of this genre. My use of interactive music can be seen most clearly in *Beat Attack*, which is a musical puzzle game.

Melodic content, while important for creating emotional and narrative links needs to be carefully thought out as a melody repeated too many times risks becoming an irritant to the player and may even cause the player to turn off the music – clearly an undesirable outcome for any video game music composer.

Another way to deal with this problem is by having randomised melodies or some kind of melodic aleatoricism(whether the melodies are composed by an algorithm or drawn from a large pool of pre-composed melodies) that still 'fit' into a piece. I explored this approach in pieces such as 'Garden', 'Spheres' and 'Eno the Truth'. The difficulty here comes when trying

to write melodies that all fit over the same set of chords and can fit together in any fashion, and the pieces mentioned above attempt to address this by creating multiple melodies that are not composed randomly. In this case the melodies can be selected randomly from a large pool of melodies, so that their application can be partially randomised yet still moulded to work within certain parameters, allowing for the music to be representative of specific narrative information but also be applicable to what is occurring on screen.

6.3 Concluding Thoughts

The indie games discussed in this thesis have shown inventive and unique ways of tackling the problems of using linear audio files in interactive contexts. They have shown how somewhere in between composed and aleatoric scores, and between interactive and adaptive music, lies a productive area for future game composers to work in. As much as dynamic music allows for a unique experience on each play-through, the music can be narratively blank. However, if the music is composed in a traditional linear fashion, it risks not being responsive to the player's actions. Although certain games do address this particularly issue, interactive music is generally used for music-based games and adaptive music for more narrative-based experiences, and trying to find a balance is certainly where my future interest in the topic lies. I believe it is indie games, with their often-innovative approaches to game design born of the productive limitations of resources and manpower, that will continue to be in the vanguard of making game music that is interactive, adaptive, and capable of presenting complex narrative information.

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"Home" - Rich Vreeland (Melody and Chords Transcription




13
17
21
25


29
33
37
40
Rit

Notes for Eno the Truth.

- The first two sections of this piece are played with an improvised melody in the right hand.
- The A section of the piece the chords are movements of 6^{th} intervals in the key of C major
- The melody needs to be improvised in the key of A major, however using mainly notes that are shared by both keys first and then slowly using more notes that are chromatic to C major.
- This A section is played as many times as the performer likes. Moving slowly from one key to the next.
- When transitioning to the section B the performer must play a major scale in the key of A major descending before starting with the chords from section B
- The B section of the song has the same chordal movement however this time in the key of A major.
- The melody needs to be improvised in the key of C major this time, with the same instructions applying.
- Section C is more rigidly notated however there is a still a slight element of improvisation for the left hand in the bass clef, during bars 18 and 20. The bass line notated here can be developed as the player repeats it. The player can also choose to repeat the parts up to four times, with the minimum amount of repeats being two.
- When the piece returns to the final iteration of the chords in C major there is no melody improvised over the chords.
- The dynamics are marked as "mp - mf" for the A and B sections, meaning the performer may use his/her discretion as to the dynamics they wish to use for those sections. From section C onward the dynamics are set.

Eno The Truth

(Right hand melody improvised - refer to performance notes)

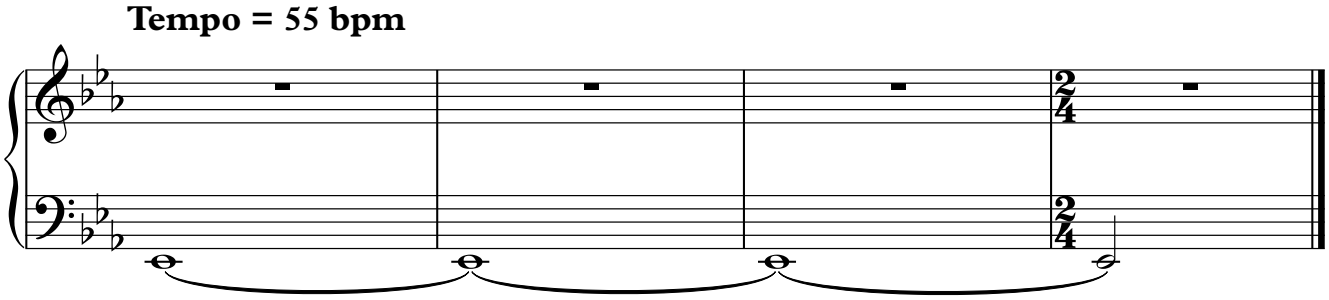
Tim Harbour



incommensurable

Part 1

Tim Harbour



incommensurable

Part 2

Tim Harbour

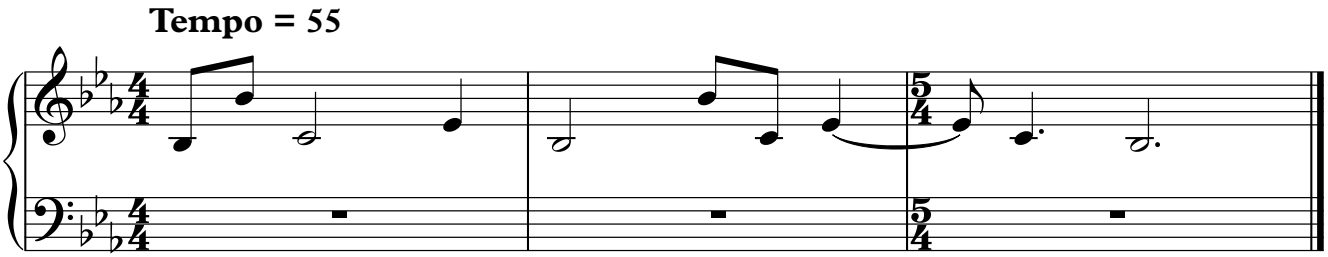
Tempo = 55 bpm



incommensurable

Part 3

Tim Harbour



incommensurable

Part 4

Tim Harbour

Tempo = 55 bpm



incommensurable

Part A

Tim Harbour

Tempo = 120 bpm



incommensurable

Part B

Tim Harbour

Tempo = 120 bpm

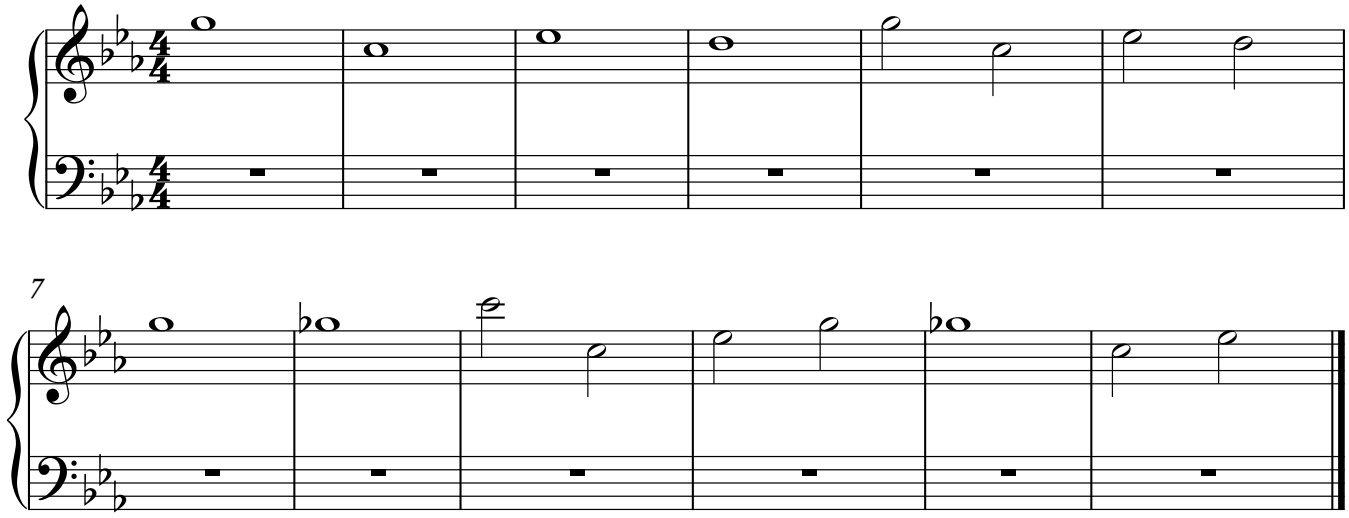


incommensurable

Part C

Tim Harbour

Tempo = 120 bpm



Notes for *Spheres*

Sphere's is a piece that sounds different on each playthrough.

Each sphere is a collection of melodies written for viola and cello, characterised by a commonly heard intervals. There are three spheres in this piece.

The performers themselves can make choices that effect the structure of the composition if they follow a few simple rules:

Melodies can be interchanged so that any of the melodies can be played at the same time as long as they belong to the same sphere.

The most basic way to exchange the melodies is to exchange any viola melody with another viola melody from the same sphere. Similarly any cello line can also be exchanged with another.

Melody lines can also be reversed.

Dynamics must be observed and are attached to the melody lines.

Melodies from the cello lines may also be played on the viola and vice versa. If the same melody is played on the viola and cello it must never be played in unison. The melodies must be separated by at least and octave and the performer may choose which octave to use.

This piece is broken up into three spheres each one creating different harmonic qualities. Each sphere also has unique expression markings.

Preparation for performers:

Though the piece is random on each performance, the performer's must prepare the piece and select their favored melodies to be practiced. This will mean although the piece will sound different on each performance depending on individual choice, each performer will have their own practiced version of the piece.

If a melody ends before another melody has finished the performer can choose to remain silent or repeat the melody from the start until the second melody ends or select a new melody and do the same.

To allow for freedom during performance the players are encouraged to substitute a melody they practiced for another one from the same sphere.

Form may be decided by the performers, however here are a few example of forms that may also be used.

Form List (listed by sphere number):

1 2 3 3 2 1 3 3 2 2 1 1

1 3 3 3 1 2 2 2 3 2 3 1

3 2 2 2 2 3 2 2 2 1 3 3

2 1 2 1 2 3 2 1 3 2 3 2

From each sphere, 2 - 4 melodies may be selected per performer.

Spheres (Original)

Tim Harbour

1A

Tempo = 100 bpm




1F
22
Vla.
Vc.
p
p
1G
25
Vla.
Vc.
f
f
p
f
f
2A
29
sul pont.
Vla.
Vc.
ff
mp
sul pont.
33
Vla.
Vc.
mp
2B
38
Vla.
Vc.
ff
ff


2C
41
Vla.
Vc.
mp
mp
2D
45
Vla.
Vc.
ff
mp
ff
2E
49
Vla.
Vc.
ff
ff
dim.
mp
cresc.
2F
53
Vla.
Vc.
mp
ff
ff
ff
2G
57
Vla.
Vc.
mp
mp
mp


4
61
Vla.
Vc.
ff
mp
3A
64
norm.
p
Vla.
Vc.
norm.
mp
3B
68
Vla.
mp
Vc.
p
3C
72
mp
cresc.
Vla.
mf
Vc.
p
cresc.
mp
3D
76
Vla.
mf
Vc.
mp


79
Vla.
Vc.
mp
3E
82
mf
mp
3F
85
p
88
90

Spheres (Mock Up)

Tempo = 100 bpm

Tim Harbour




23
1A and 1G
Vla.
Vc.
28
1G and 1B
f
Vla.
Vc.
33
2A and 2E
mp
mp
Vla.
Vc.
37
Vla.
Vc.
41
2C and
2B
Vla.
Vc.

2A and
2B + 2C

45

Vla.

Vc.

2F and 2G

50

Vla.

Vc.

2D and 2E

55

Vla.

Vc.

2F and 2B

59

Vla.

Vc.

63

Vla.

Vc.

3a and 3f

67

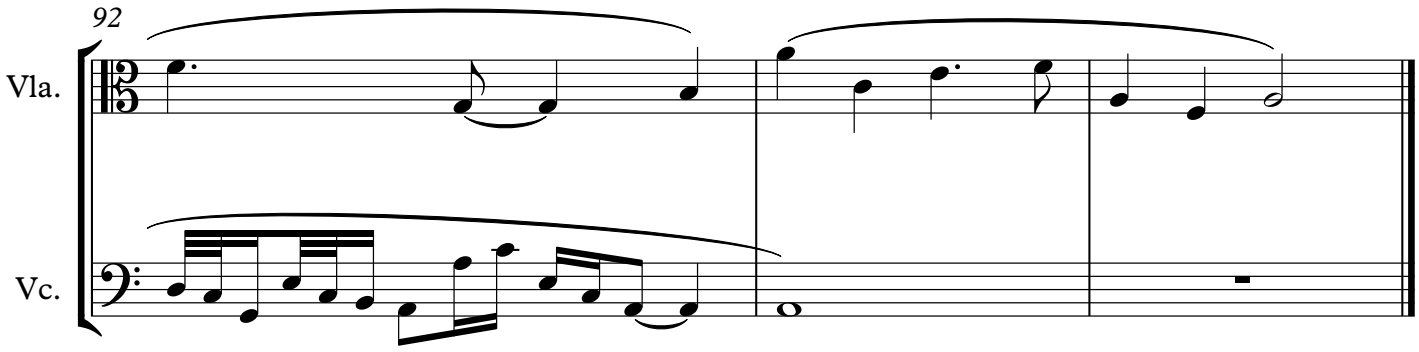
Vla.

mf

Vc.

mf


3c
71
Vla.
Vc.
3c and 3e
76
Vla.
Vc.
mf
3b swapped
80
Vla.
Vc.
3d and 3f
85
Vla.
Vc.
3b and 3f
89
Vla.
Vc.


92
Vla.
Vc.

Canvas

Tim Harbour

Tempo = 120 bpm



16



19



22



26



29



32




35
38
42
f
f
45
48
51


54
57
p
p
60
63
mf
mf
66
f
f
70


73
76
79
82
ff
ff
85
88


92
p
pp
95
98
101
mp
104
107
mf


111
114
117
f
f
120
123
126


129
mf
mf
132
135
138
mp
mp
141
f
f
144


147
150
153
156
ff
ff
159
162

10



Garden - Section 1

Tim Harbour

Tempo = 77 bpm

Duduk

Ney

Vibraphone

Double Bass

3

Vib.

Db.


5
Vib.
Db.
7
3
Vib.
Db.


9
Vib.
Db.

Garden - Section 2

Tim Harbour

Tempo = 77 bpm






5
Vib.
Db.


7
Vib.
Db.

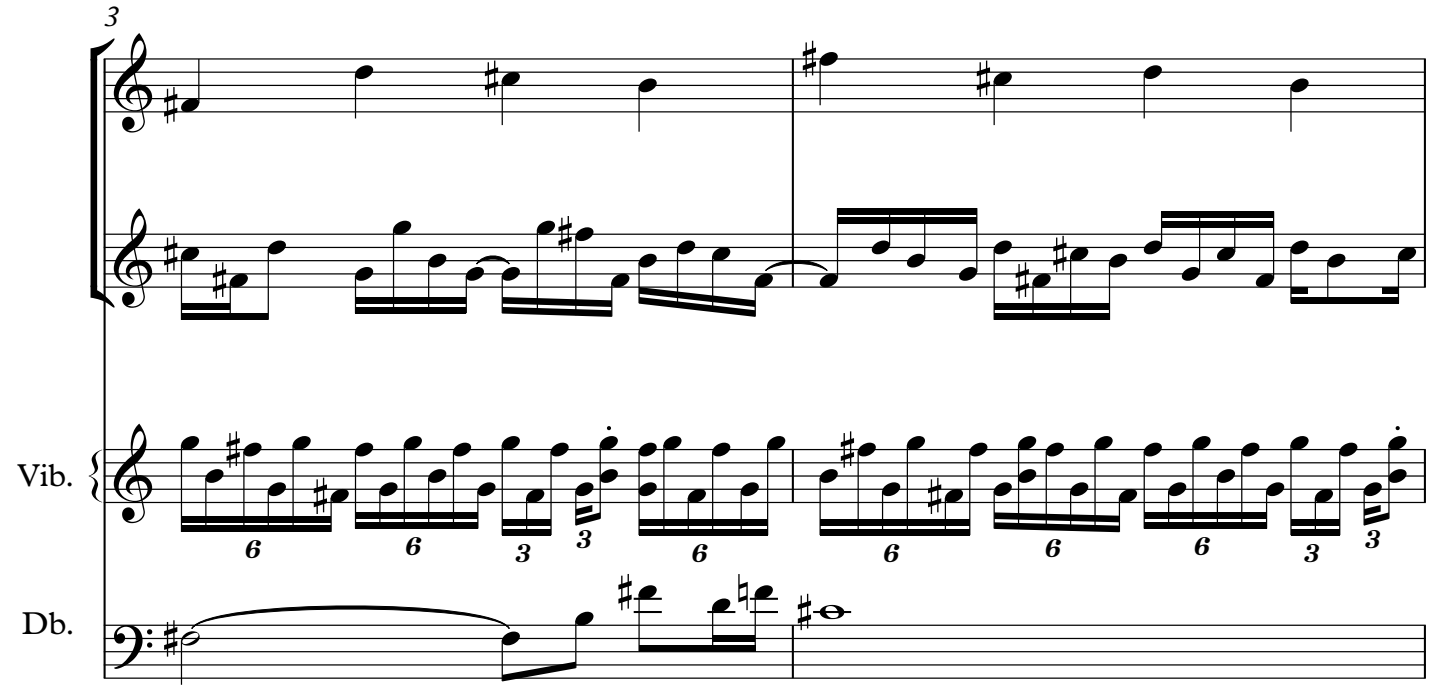

8
Vib.
Db.

Garden - Section 3

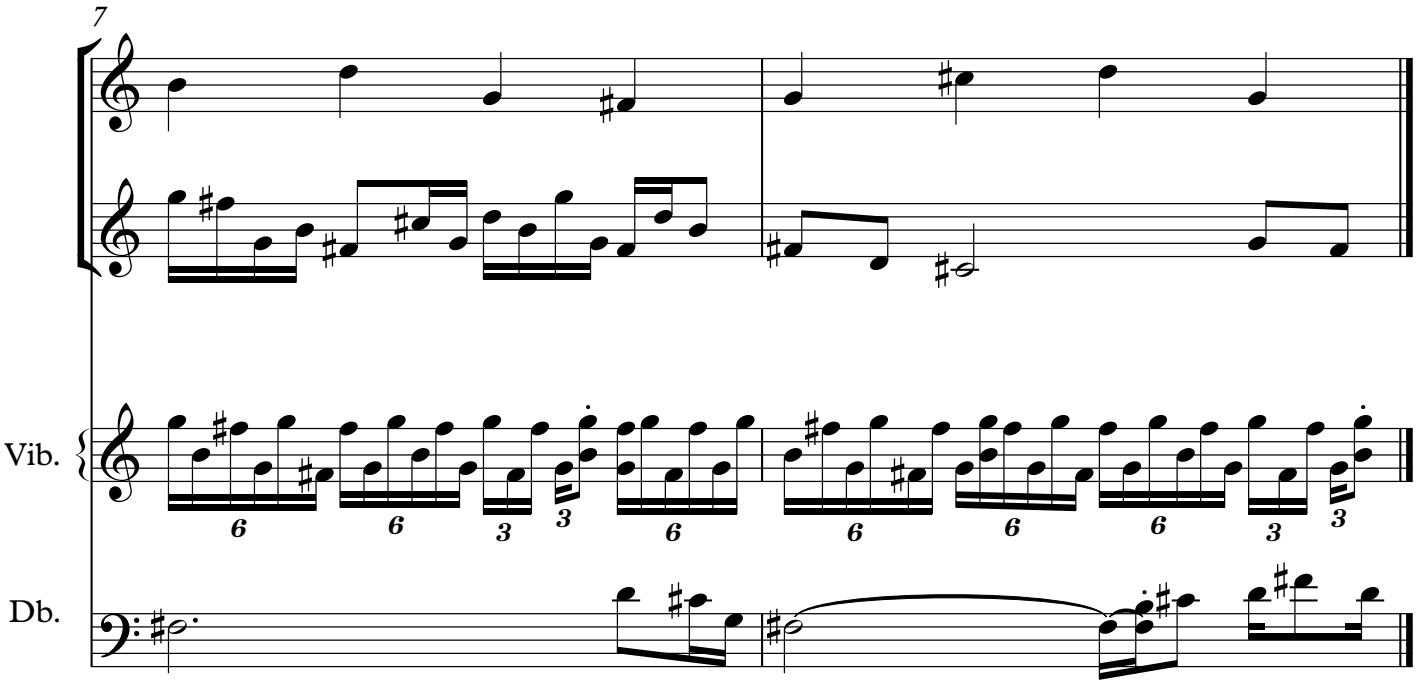
Tim Harbour

Tempo = 77 bpm






5
Vib.
Db.


7
Vib.
Db.