The Narrative Application of Synthesizer Timbre in Soundtrack Music

by

Aidan Brych

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Thesis Committee:

Drew Nobile, Chair

Stephen Rodgers, Member

Jack Boss, Member

University of Oregon

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THESIS ABSTRACT

Aidan Brych

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In this thesis, I demonstrate the value of analyzing timbre separate from sound source identification. Much of the scholarship done on timbral analysis focuses on acoustic instruments, which leads to the cultural connotations of the instrument affecting the understanding of its timbre. In order to avoid this, I focus on non-imitative synthesizer timbres and combine timbral analysis with film and video game music analysis to demonstrate how timbral adjectives can interact with their narratives. First, I expand on the idea of *leit-timbre*, showing that combinations of timbral adjectives can be used to signify narrative elements present in a story. I also put forward the idea of *timbral incongruence*, where the timbre used in the soundtrack creates a conflict in the audio-visual relationship of a film or video game. I then analyze a video game soundtrack and a film soundtrack composed by Disasterpeace, who primarily uses synthesizers.

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Chapter 1: Introduction and Literature Review

Video games and synthesizers have been linked since their inception. In early video games, this link was a result of hardware limitations, with studio recordings taking up too much data to be viable in early games. While big-budget triple-A studios moved to orchestral scores once storage space allowed it, independent video games, which continue to make up a large part of the gaming market, still commonly use synthesizers in their soundtracks. They likely do so for two reasons: first, practically speaking, synthesizers are cheap, but second, in using synthesizer timbres, these games are honoring the legacy of early video games by incorporating their soundscapes. As a result, video games have provided many opportunities for electronic artists to participate in the genre, artists who have then gone on to have success composing for both video games and film. In this thesis, I will analyze synthesizer timbres in soundtrack music, demonstrating how doing so can reveal new insights into the narrative function of timbre. I will be focusing on the composer Disasterpeace, who has composed soundtracks for both video games and movies.

Disasterpeace is the online pseudonym of electronic artist and video game/film composer Richard Vreeland. Vreeland graduated from the Berklee College of Music with a degree in music synthesis and later had an internship working in MIT's game lab (Vadim 2014). Following his graduation, Vreeland went on to have a successful career writing soundtracks for video games, with his first big hit being the 2012 indie game *Fez*. He wrote soundtracks for several other video games with varying degrees of popularity, but eventually, Vreeland pivoted into making soundtracks for film. This is what makes Vreeland an interesting case, since he has an education and a lengthy career in making video game music, and so he takes some of those sensibilities into his film scores. This is especially pertinent since he mainly uses synthesizers for both video

games and film, and utilizes the unique timbral qualities of synths in order to contribute to the narrative of the given work (Vreeland 2015).

His work in synthesizer music, in conjunction with his musical education, can also highlight key differences in what electronic composers (as well as their listeners) value compared to orchestral composers. In his blog, Vreeland describes his attempts to compose and notate the score for the game *Hyper Light Drifter* as opposed to recording directly into a Digital Audio Workstation (Vreeland 2016). He talks about how transforming the written score into an electronic piece did not work out, and he had to completely rewrite the score, this time directly recording synthesizers inside a Digital Audio Workstation. This demonstrates how composing for synthesizers is drastically different from composing for acoustic instruments, with the main difference being the malleability of its timbre and its ability to change over time. It is my hope to demonstrate that these differences allow synthesizers to explore and create new musical meaning through the use of their timbre, primarily when it comes to soundtrack music. I use the term narrative to refer both to plot elements present in a given work as well as the mood and themes that the work presents to the audience.

In this thesis, I demonstrate how Disasterpeace utilizes synthesizer timbre in his soundtracks to interact with the narrative of a given work. I do so by analyzing his score for the video game *Hyper Light Drifter* (2016) and his score for the film *It Follows* (2014), which was the first film he worked on. Drawing on methodologies by Megan Lavengood (2020), Jonathan de Souza (2021), and other scholars, I categorize Disasterpeace's synthesizer sounds based on their timbral attributes and discuss how they are embodied through force schemas (Wallmark 2022). After categorizing the synthesizer sounds, I then show how Disasterpeace's timbres enhance the narratives in these two works.

Before getting to these analyses, I will establish two methodologies for analyzing timbre's narrative function. The first will be an expansion on the concept of *leit-timbre* (Titus 2016; Oden 2021), where specific timbres are used to signify a person, place, or thing in a narrative. Traditionally, discussions on leit-timbre focus on sound source identification, noting where specific instruments are used to signify narrative elements (Titus 2016). I wish to analyze how specific combinations of timbral attributes can function as leit-timbre. The second will be a concept I call *timbral incongruence*, where the timbres used in a soundtrack create a contradiction in the audio-visual relationship of a film or video game. This contradiction can deepen the narrative of the work by creating new intratextual meaning.

Synthesizers and Timbre

Synthesizers lie in a unique position when it comes to discussions about timbre. Being an instrument that relies solely on electric currents to emulate sound waves, synthesizers do not project the same materiality that is present in the timbres of acoustic instruments. When a listener hears an acoustic instrument, they naturally try to place that instrument in a physical space. A part of this is the tendency to link sound with the physical properties of the instrument that makes it, such as hearing oboes as reedy or a glockenspiel as metallic. Since synthesizers do not create sounds acoustically through the vibration of their parts, they do not have the same materiality that acoustic instruments have. This is the case when synthesizers aren't used in order to mimic or serve as an icon for an acoustic instrument. This concept is discussed by Jonathan De Souza, who states that synthesizers can create "sonic phantoms" (2018, 364), since there is a disconnect between the physical object that is a synthesizer and the sounds it creates, and there is no iconic function. This lack of materiality makes it difficult for the listener to position the

instrument in physical space. In combination with this lack of materiality, synthesizers are extremely flexible in the timbres they can generate. Subtractive synthesis can generate a variety of different sound waves, which can then be modified through the use of filters. All of these capabilities can be linked and control one another, so synthesizer timbres can be flexible within a singular patch. All of these attributes in combination make it difficult to ascribe consistent semiotic meaning to synthesizers themselves. Instead, meaning is derived directly from the timbre that the synthesizer is generating at that particular moment in time, not from the fact that that timbre is coming from a synthesizer.

In Piercean semiotics (Bateman 2018), timbre can function as a sign and create meaning in three different ways: an *index* when the source of the sound is considered, an *icon* when the sound resembles/mimics another sound, and a *symbol* when a cultural meaning is assigned to it (Oden 2021). The timbral flexibility and lack of materiality diminish the synthesizer's ability to function as an index as effectively as, for example, a trumpet, which is much more limited in the sounds it can produce. A trumpet would also function better as a symbol due to its cultural and historical connotations, bringing to mind fanfares, royalty, the military, and superheroes. The synthesizer lacks these historical/cultural connotations, and so does not function well as a symbol separate from its timbre.

The synthesizer's lack of indexical or symbolic meaning is what creates its unique position, since the very timbre itself is what creates the meaning, separate from an index or sound source identification. When the timbre of acoustic instruments is discussed, there is often a focus on indexical meaning, but synthesizers have been shown through their use in different genres that they can carry symbolic meaning without indexical or iconic meaning. The trumpet's timbre arguably doesn't function as a symbol without considering its index. Since synthesizers

lack strong indexical function, their timbre can be conceptualized as *acousmatic*, where "sounds experienced are divorced from their producers" (Hamilton 2005). It is because of this distinction that synthesizers can serve as a basis to analyze the role that acousmatic timbre plays in how we perceive music.

In this thesis, I will show how the study of synthesizer timbres can provide greater insight into the applications of timbre, free from source identification, in music analysis. Synthesizer timbres have been studied before[1], but there is a lack of literature demonstrating how these timbres can create intramusical narrative, particularly when it comes to video game and film soundtracks. Although synthesizers do not have consistent *indexical* or *iconic* meaning, their use in a soundtrack means they often function as a *symbol* in some way, since they are connected to a work that has a narrative of its own. This leaves the synthesizer's timbre as the main agent of meaning creation.

Main Scholarly Conversations

This thesis will contribute to conversations in three areas: music theoretical work on synthesizers, film music analysis, and video game music analysis. For synthesizers, there has been much discussion about their timbre, but not much about their usage in soundtrack music. For film music, there is a prevalence of analysis when it comes to harmony and melody's role in reinforcing narrative, as well as a wide breadth of writings on topic theory. Much of modern video game music analysis (ludomusicology) is about how the soundtrack of a video game reinforces gameplay and the player's experience, and, similarly to film, topic theory is common.

[1] For more on synthesizers, see Bode 1961, Bruger and Toiviainen 2018, Pinch and Trocco 1998, and Puentas 2023.

By combining these three areas, I hope to provide deeper insight into how synthesizers function in film and video game music.

Synthesizers

Prior discussions of synthesizers have largely focused on how synthesizers imitate the sounds of acoustic instruments. One example of this is Jonathan De Souza's "Timbral Thievery" (2018), which explores the history of the Yamaha GX-1 synthesizer's timbres being used to imitate instruments such as trumpets or string sections—when they do not, they become, in his words, "sonic phantoms" (364). Others have responded to this idea of the sonic phantom by trying to assign materiality to the synthesizer, but this is usually through the synthesizer's timbre functioning as an *icon*, for example, by imitating the voice of a robot (Lunt 2023). This positions the synthesizer's timbre in a sort of binary opposition of imitation vs. non-imitation, where it is concluded that synths cannot escape source identification since even the sonic phantom will be related to its lack of a source. Megan Lavengood similarly analyzes the timbre of the Yamaha DX-7 synthesizer by exploring the pre-made sounds that were made to imitate non-Western instruments (Lavengood 2020). Borrowing a system of binaries from Robert Cogan (1984), Lavengood demonstrates how certain timbres were "marked" (Hatten 1994), thus carrying symbolic meaning. More recently, Lavengood has explored synthesizer timbres that do not carry indexical or iconic meaning in a lesson plan teaching timbral analysis to students while avoiding sound source identification (2025).

Film Music

The study of film music is a field that is nearly as old as film itself. The composers of early film music often considered themselves torchbearers of the Wagnerian tradition, hewing to his late-

Romantic orchestral style (as heard, for instance, in the music of Eric Korngold and Max Steiner). This prevalence is explored by Kathryn Kalinak, showing how inspirations from classical music and the idea of the "notated score" have become a feature of Hollywood music (2019). Analysts accordingly have focused on aspects such as leitmotifs (Bribitzer-Stull 2018) and chromatic harmony (Murphy 2013; Lehman 2018). Topic theory is another common field of film music analysis where the invocation of clichés is used to "communicate meaning to an audience" (Bourne 2024).[2]

There is, however, scholarship that has broadened the range of topics when it comes to film music analysis. Discussions of diegetic vs. non-diegetic film music (diegetic meaning that the music is happening in the world of the film, with non-diegetic meaning the music is happening only for the audience) and how both serve narrative function have become increasingly prevalent (Winters 2010). A study by Siu-Lan Tan more recently delved into the perceptual effect diegetic music has on a viewer (Tan et al. 2017) What will be most relevant to this thesis is the work of Joan Titus (2016) and Chelsea Oden (2021). Titus analyzes the early film music of Dmitri Shostakovich, finding that Shostakovich often used specific instruments to signify certain concepts. This made timbre function much in the same way as a leitmotif, and Titus thus coined the term *leit-timbre*. Titus demonstrates several different instrumental timbres that are used as leit-timbres and shows how they undergo transformation in order to reflect changes in the narrative of the film. A popular example of leit-timbre is in *Peter and the Wolf* by Prokofiev, where every character in the story is explicitly stated to be represented by a different instrument. Chelsea Oden (2021) uses the idea of the leit-timbre to analyze modern films from a culturally informed perspective, showing how certain instruments are used to signify ideas by

[2] Topics serving as musical signs can be thought of as an extension of semiotic symbols, signs that are based on culturally trained understandings.

invoking cultural *symbols,* such as how African talking drums are used in *Black Panther* to signify the fictional African country of Wakanda. Oden recently stated that "timbre should occupy the center of film music analysis" and "timbre (is) a communicator of generic, emotional, and even denotative (leitmotivic) information on the soundtrack" (Oden 2024). In this thesis, there will be interactions between different musical aspects that will contribute to musical meaning, but I will focus on timbre, as in my chosen examples, they are the most salient aspect.

Video-game music

Video-game music has only recently drawn music-analytical attention. This is partly because video games, as an electronic medium, became widely accessible only during the late 20th century. Similar to film music studies, topic theory is a popularly discussed topic in video game music, such as in Neil Lerner's (2014) exploration of how early video games invoked topics from early cinema. Topics are especially useful when discussing video game music since a usual format of video games is to have *levels*: areas of play often separated by loading screens or level select menus that often have different settings/themes. This concept is shown by Megan Lavengood and Evan Williams's (2023) exploration of the "Winter Topic" in video-game levels set in snowy areas. An important aspect of video-game music is the change in what people think of when they hear the phrase "video-game music." Much of the research being done in video-game music focuses on how the music interacts with gameplay elements, such as with Julianne Grasso discussing how changes in music in conjunction with changes in game states affect the player's sense of temporality (2019). William O'Hara challenges previously conceived separations between performer and listener by analyzing how the music from the game *Proteus* (2013) changes to adapt to the players' actions, therefore making them a part of the creation

process (2020). There is also an intersection of timbral analysis and video game music analysis with Blaire Ziegenhagel's analysis of musical "corruption" in horror video games (2025).

Due to the hardware limitations of early video game consoles, sound chips were used that acted as limited synthesizers that could play the soundtrack. This was the case for nearly 30 years, leading to video game music and what is now referred to as "chiptune" being thought of as the same thing (Munday 2007). Video games are not limited to sound chips anymore, with large game studios now emulating film scores in terms of their production value. The cultural link between video games and synthesizers is still present, with games created by indie developers still widely using synthesizers in their soundtracks. This means that video games provide a large sample size of soundtrack music available that is largely made up of synthesizers, possibly more so than in film.

A Focus On Acousmatic Timbre

In the next chapter of this thesis, I will outline the methodologies I used to both identify timbral attributes as well as ascribe meaning to those attributes. This will be done using oppositional adjective pairs used to describe timbre (Lavengood 2020) and ideas of timbral embodiment, such as *force schema* (Wallmark 2022). The timbral adjectives will be assigned based on spectrograms, as well as aural analysis done by me. Rather than compare the timbres to a baseline as Lavengood did, I will compare the timbres of the instruments within a given score to designate timbral adjectives. By focusing on synthesizers which lack indexical and iconic function, timbre will be put at the forefront and will be shown to, alone, be able to carry meaning. This is in contrast to scholars like Lavengood, who focused on analyzing synth timbres that were named after and imitating acoustic instruments, which in turn influenced the analysis

since the imitated instruments carry their own culturally understood meaning. In order to ascribe meaning to specific timbral adjectives, I utilize Zachary Wallmark's ASPECS model but focus on E (experience) and C (concept) as I am avoiding the evocation of cultural signification (S). After establishing this, I will expand on the concept of leit-timbre discussed by Titus (2016) and Oden (2021) by focusing on how combinations of timbral adjectives can be used to signify narrative elements. I will also put forward the concept of timbral incongruence, showing how timbre can be used to create conflict in the audio-visual relationship of a video game or film. I will analyze two different soundtracks composed by Disasterpeace, those being the video game *Hyper Light Drifter*, and the horror film *It Follows*. I will show how both leit-timbres and instances of timbral incongruence are used throughout both of these works in order to reinforce and add depth to their respective narratives.

Supplemental Material

The video and audio examples used in this thesis can be found in this Dropbox folder: https://www.dropbox.com/scl/fo/9o2hb61hoatb89kqkex7u/AJeSY5OR757NkDKRXs1C2F4?rlkey=14ktumynatt2yphlj8bh1t8p1&st=fbopq5iy&dl=0

Chapter 2: Timbral Congruence and Reference in Soundtrack Music

Soundtrack music stands in a unique position when it comes to narrative analysis. Since the music is accompanied by visual elements that convey a narrative, the music will, in the viewer's mind, be connected to whatever narrative or visual they are currently witnessing. This effect is so strong that even when listening to a soundtrack separate from its source, the music will evoke elements of the film/video game if the audience is familiar with the source material. Every aspect of a soundtrack is thus in some way connected to the narrative of the given work. That includes the timbre. Just as it is possible to analyze certain harmonies and melodic gestures as they connect to the plot of a movie or video game, it is possible to analyze how timbre connects to the narrative. In the 2017 movie *Justice League*, for example, there is a scene that introduces the superhero Wonder Woman by having her thwart a terrorist attack. Wonder Woman's main theme is heard, which employs a string section as well as an electric guitar playing the melody with percussion playing a constant tresillo. As outlined by Steve Halfyard, superhero themes in our media often employ brass instruments that evoke the military topic: "The usual music of superheroes in cinema encodes the tropes of colonialism through the use of the military topic… the use of horns and trumpets singing out over the body of the orchestra…" (2025, 183). The Wonder Woman theme, using a string instrument for the melody, acts as a subversion of the typical "masculinity" heard in superhero themes, but creates power through the strings being distorted: "The fanfare-style motifs of horn and trumpet battle calls are replaced with a chromatic motif on electric cello that is both constantly loud and distorted" (186). The instruments used (and therefore the timbres) are acting as symbols that create musical meaning, separate from the notes or chords they are playing.

There are many methodologies for analyzing how music interacts with narrative elements in order to create meaning. Some focus on how formal trajectories in music relate to narrative arcs, such as how Judith Ofcarcik used multiplot forms from Victorian fiction analysis with sonata form analysis (2020). Many scholars use semiotics, studying how musical elements are used to signify an underlying narrative. Leitmotifs are a popular example of this, with melodies being used to signify characters, locations, and other elements of a narrative.

I will be using methodologies that fall under the field of semiotics, analyzing how timbre is used in soundtrack music to signify elements of the attached movie or video game. I will be focusing on soundtrack music that uses synthesizers, as it reduces the importance of sound source identification (the indexical function of a sign). I will, through the lens of semiotics, explore the concept of *leit-timbre*, when the timbre of an instrument functions as a leitmotif, and introduce the idea of *timbral incongruence*, when the timbre of a soundtrack is incongruent with the narrative of a movie or video game. It must first be established how leitmotifs and congruency alone can connect with and contribute to the narrative of a given work before understanding how timbre does so.

Leitmotif in Film and Games

Film music has long been associated with leitmotifs, going back to the genre's early days when composers were attempting to legitimize their art form in the eyes of the public. As Matthew Bribitzer-Stull (2015) describes, one way they did this was by claiming they were the ones carrying on the "Wagnerian Tradition," especially by using leitmotifs. Leitmotifs are generally understood to be short melodies used in a composition that signify specific elements of a narrative, such as a person, place, or thing. Wagner famously used leitmotifs in his operas, but

they are also regularly used in many different classical as well as non-classical styles. Bribitzer-Stull, for example, has written about the traditional use of the leitmotif in classical music and how it is transferred to other, more modern music genres (2015). An example of leitmotifs in classical music is Schubert's "Erlkönig," which makes use of several leitmotifs to signify multiple characters in the narrative. "Erlkönig" is a setting of a text that describes a boy haunted by a supernatural being, and his father, who rides through the forest to save him but is unsuccessful. The father is represented by a melodic fourth, the son by a neighbor tone, and the struggle between the son and the titular Erlking is represented by a chromatic passing tone motive (Stein 1989). There is also a trend in scholarship of not just expanding the settings in which a leitmotif can be employed, but also what constitutes a leitmotif. Ronald Rodman has written about how popular songs function as leitmotifs in the movies *Pulp Fiction* and *Trainspotting* through their repetition and association with onscreen characters (2006). Scott Murphy has analyzed the use of leitmotifs in film that utilize chord progressions rather than melodies, claiming that certain chord movements in the 2002 animated movie *Treasure Planet* are used to signify elements of the narrative (2006).[3]

A more straightforward example of leitmotifs in film occurs in the *Lord of the Rings* trilogy, whose scores were composed by Howard Shore. These films are full of leitmotifs representing everything from factions, concepts, settings, and characters. The *Shire Theme*, heard in **Audio Example 2.1,** as its name suggests, represents the Shire, where the main characters Frodo and Sam reside. It is heard when we are first introduced to the Shire, and it demonstrates the joy and beauty that is there. During a scene in *The Two Towers,* the second movie in the series, Sam gives a speech about how even though they are surrounded by darkness, there is still

[3] For more on leitmotifs, see Justin London 2000, Ronald Rodman 2011, Kendra P. Leonard 2018, and Ji Yeon Lee 2022.

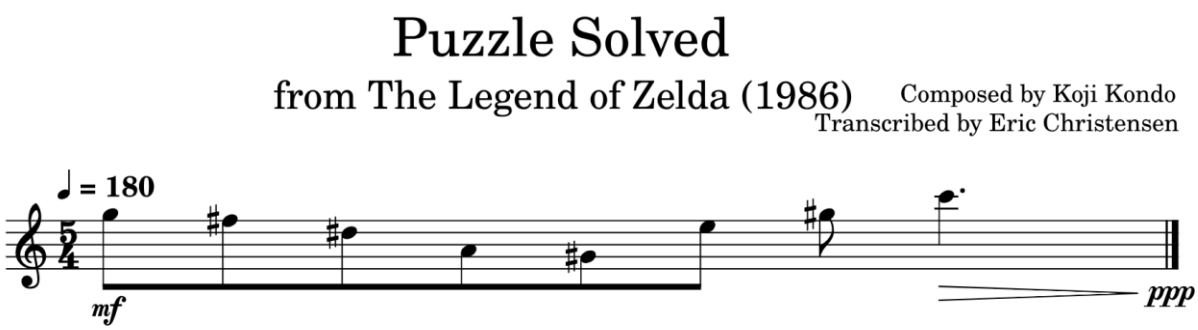
good in the world worth fighting for. After his speech is finished, the main motif from the *Shire Theme* is heard. This is shown in **Audio Example 2.2.** This shows the audience that when Sam says that there's good worth fighting for, both he and Frodo think of the Shire, their home.[4]

Audio Example 2.1. A snippet of "The Shire Theme" from The Lord of the Rings: The Fellowship of the Ring (2001).

Audio Example 2.2. A snippet of audio from *The Two Towers* (2002) where the motif from "The Shire Theme" can be heard.

Leitmotifs are also present in video games, but they often function as a tool to convey elements of the gameplay to the player rather than a way to convey a narrative. The long-running video game series *The Legend of Zelda* has several examples of this that have been present for decades. In *Ocarina of Time* from 1998, there is a piece of music that is played every time the player interacts with and solves a puzzle. A transcription of this song can be seen in **Example 2.1.** This same song is also heard in the 2011 game *Skyward Sword* and is used in the exact same way, playing when a puzzle is solved. This melody serves to let the player know, whatever game in the series they are playing, that they have finished a specific area/room and can now progress.

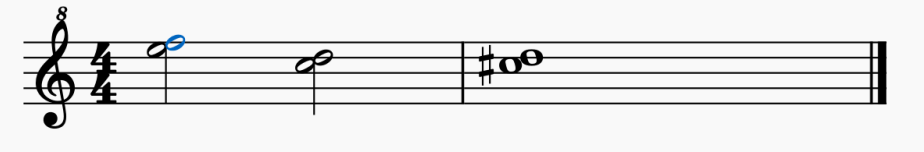
[4] Other film composers who make regular use of leitmotifs are Miklós Rózsa (Ben Hur, Spellbound, The Lost Weekend), Jerry Goldsmith (Planet of the Apes, Chinatown, Rambo), Bernard Herrman (Psycho, The Trouble with Harry, Taxi Driver), and Stephen Spielberg (Star Wars, Indiana Jones, E.T.).



Example 2.1. The "Puzzle Solved" theme from *The Legend of Zelda*.

Another example of leitmotifs being used in video games is in the 2009 game *Left 4 Dead 2*. In contrast to the *Legend of Zelda* example, where the leitmotif almost served as a reward to the player, the leitmotifs in *Left 4 Dead 2* serve to alert the player to a change in the game state. These motifs play an active role in the player's experience, requiring them to recognize the motifs and react accordingly in order to play the game more effectively. The game involves four characters, all of which can either be player- or game-controlled, moving through a series of levels that are infested with zombies. Most of what players encounter will be standard infected (the term used to refer to zombies in-game) that will sprint at them, but while playing, a type of enemy called a "special infected" can randomly spawn into the level. These enemies are much more dangerous and have special abilities that can severely harm the player characters, and so the game warns the player that one has spawned by playing specific melodies (called special infected cues) that are linked to specific special infected. For most of the levels, there is not a consistent soundtrack that is heard. The only music heard is the cues for when the special infected spawn in, and since the order and speed at which the special infected can spawn is random, this creates a generative soundtrack. A generative soundtrack is when the soundtrack to a game is made up of disparate recordings that are then arranged either in a random order or according to what is happening in the game (Bossalini et al., 2020). One of the special infected

that can spawn is the hunter, which can leap far distances and immobilize the player while damaging them over time. When a hunter spawns, the cue seen in **Example 2.2** is played. This cue lets the player know to prepare themselves to counter the hunter's leap with a shove attack. Another type of special infected is the boomer, a large zombie swollen with goo that explodes when shot, covering the player and attracting a horde of zombies. When a boomer spawns, the cue seen in **Example 2.3** is played. This lets the player know they have to be cautious when going around corners and not be too trigger-happy lest they attract a horde. This demonstrates the prevailing use of leitmotifs in video games as a way to inform the player of changes in game state.



Example 2.2. The hunter cue from *Left 4 Dead 2.*



Example 2.3. The boomer cue from *Left 4 Dead 2*.

Leitmotifs are present in both video games and film, but often function differently, with film using them to signify elements of the narrative and video games using them to signify changes in the gameplay state. This is most likely due to the lack of narrative focus historically present in video games; as described by John Carmack, the creator of the 1993 video game *Doom*, "Story in a game is like a story in a porn movie. It is expected to be there, but it is not that important" (Kushner 2003). Even at the time of *Doom*'s release, this quote was not the whole truth, with popular video games such as *Blood Omen: Legacy of Cain* (1996) and *Fallout* (1997) having a strong focus on story. However, there is an increasing number of games with a strong

narrative focus, like in computer role-playing games such as *Undertale 2014* and the adventure games made by Naughty Dog studios, such as *The Last of Us* and the *Uncharted* series, both of which have been compared to movies. This has led to video games employing leitmotifs for narrative purposes in video games with a lot of cutscenes or a focus on narrative. Film, similarly, can use leitmotifs to mark the beginning or end of scenes, functioning similarly to video games by letting the audience know that the narrative is moving on to a new section.

Musical Congruence

Whenever music is heard during the viewing of a film or while playing a video game, that music will be connected in the mind of the listener to the given work. As explained by Lena Straßburger, as recipients of information are encoding, they are constantly and repeatedly making predictions of what will happen in the future, often subconsciously: “Recipients update the discourse representation dynamically in the course of the incoming information. In doing so, on one hand, the recipients can better process and structure the discourse and, on the other hand, make better predictions for expected future information and sensory inputs” (2022, 50). As a viewer perceives the audio-visual relationship in a movie or video game, they are in a perpetual state of encoding and prediction, which places them in a state where a disruption to their prediction leaves them in a state of “surprise (and) incongruency” (51). Musical congruence and incongruence, respectively, occur when the audio-visual relationship either follows or disrupts the discourse representation in the recipient's mind. Scott Lipscomb describes musical congruency as falling into three distinct categories that all have different narrative functions: when the soundtrack reinforces the mood, when the soundtrack creates the mood, or when the soundtrack contradicts the mood of the film (2005). David Ireland has more recently expanded

on this concept, rejecting the simplicity of incongruency being an audio-visual mismatch of moods and instead emphasizing the "subjectivity, context-dependency, and multi-dimensionality inherent in identifying and interpreting incongruent film music" (2018). Ireland has also stated that "separate perceptual encoding associated with incongruence may be more noticeable to the perceiver," but that the "incongruent perspective" allows the possibility of musical incongruence being not consciously perceived by the viewer due to the audiovisual relationship operating at lower levels of difference (Ireland 2015). This thesis will take an interdisciplinary perspective, and the simplicity of Lipscomb's categories will be explained in the upcoming sections in order to provide a framework that demonstrates what makes musical incongruency unique.

Congruence

Congruence is by far the most common way a soundtrack contributes to the narrative meaning of a given work. *Congruence* is when the mood of the soundtrack clearly reflects the mood of a given scene or reinforces the narrative of a scene. This could be, for example, fast and loud drums coming in during an action scene or a mournful violin during a character's death. Congruence relies on certain topics and tropes that are commonly used to signify certain emotions or scenes or even an understanding of the conventions in a certain genre (Ireland 2015). Since the mood of the soundtrack and the given work are working in tandem with a viewer's expectations, there is no contribution of additional meaning. In the 2002 movie *Spider-Man*, the uncle of the main character, Peter Parker, is shot and killed due to his own actions. In this scene, Peter walks to where he was supposed to meet with his uncle, only to see police cars and a crowd. After pushing through, he sees his uncle lying on the floor, dying. During his uncle's last moments, a trumpet can be heard playing a rendition of the main motif of the film, accompanied by a brass and string quartet playing quietly in minor. The use of trumpet evokes the playing of

Taps at a funeral, and when combined minor key and string accompaniment, there is a "semantic relation" that has been reinforced by film tropes and is recognized by the educated viewer, an idea posited by scholars in topic theory: "...there is some kind of semantic relation between music and the emotions or that the very distinction between music and the extramusical breaks down" (Martin 1995).[5] In another example from the 2006 movie *Casino Royale*, there is a chase scene early on in the film where the main character, James Bond, chases a man through a city in Madagascar. This chase goes through crowded streets, markets, and finally through a construction yard. This scene is accompanied by a soundtrack that has a fast tempo and an orchestra. The musical element most at the forefront is the drums, which play a hectic rhythm that, in combination with the fast tempo, conveys a sense of speed and urgency to the viewer.[6]

Creation

Creation is when what is happening on screen is either vague or devoid of narrative, and so the soundtrack is what creates meaning. The main way this happens is during scenes of transition, such as loading screens and menus in video games and establishing shots in movies. This type of music exists in a unique position since it must have narrative meaning, since it is attached to a film or game, but it is also the main contributor to the mood of the scene. As mentioned, establishing shots in movies are where this most often happens. This is the case in the 2008 movie *The Dark Knight*. There is an establishing shot towards the beginning of the movie of Gotham City at night, in combination with a dark, moody soundtrack. A screenshot of this shot can be seen in **Example 2.4**.

[5] This scene can be seen here: https://youtu.be/9LglzW3HFyg?si=gnHC_9DjUH2aYiqp&t=111
[6] This scene can be seen here: https://youtu.be/iZxNbAwY_rk?si=b_HoCvk4ZsqMg78p&t=46



Example 2.4. Gotham City at night in *The Dark Knight* (2008).

There is an ominous double bass underscored by fast-moving high strings that makes the first shot of the Gotham City skyline have a feeling of somber nobility.[7] As an opposite example, in the 2002 romantic comedy *My Big Fat Greek Wedding,* there is a very similar establishing shot of a city during the night. There's even rain in this establishing shot, which is often indicative of dramas like *The Dark Knight*. A screenshot of this shot can be seen in **Example 2.5.**

This shot, if accompanied by similarly dramatic music, could very easily come off as dark and mysterious, but instead, we hear a piece of music with traditional Greek instruments, creating a light and almost jovial feeling with bright timbres and a catchy melody, all over an oom-pah rhythm. This creates a drastically different mood from the music heard during *The Dark Knight,* even though both shots are visually very similar, demonstrating how the music is what creates the meaning in these instances.[8]

[7] This scene can be seen here: https://youtu.be/Wu-Jj8xRiEI?si=sz0DMbsMBNnoJ1sn
[8] This scene can be seen here: https://youtu.be/8qppm-4NDNg?si=1JivRItslSfwY_0j

An example of this in video games is in the main menu of the 2014 horror game *Alien: Isolation*, based on the *Alien* movie franchise. The main menu is very minimalist, with the options appearing in a simple font at the bottom left and an image of a planet and a ship in the distance. An image of the main menu is shown in **Example 2.6.** This could easily be an establishing shot of a *Star Wars* film, but the music heard is eerie, with what sounds like a swarm of violins playing an atonal mass with high, reverberating vocals fading in and out. This then fades into an ominous soundscape before repeating.[9] It would be different if the visuals of the main menu were accompanied by the *Star Trek: The Next Generation* theme song, which sounds awe-inspiring with long drawn-out strings and synths with lots of reverb, but also optimistic and adventurous with trumpets playing a fanfare, accompanied by an orchestra. Although *creation* places more emphasis on the music due to it being the primary narrative force, it doesn't call attention to itself due to a lack of audio-visual contradiction, since the visual element isn't providing a narrative, and because the narrative created by the soundtrack is often contextually informed by the overall narrative of the movie or video game.



Example 2.5. Establishing shot from the beginning of *My Big Fat Greek Wedding*.

[9] The music can be heard here: Alien Isolation | Menu Music | Ambient Soundscape



Example 2.6. Still image from the main menu of *Alien Isolation* (2014)

Incongruence

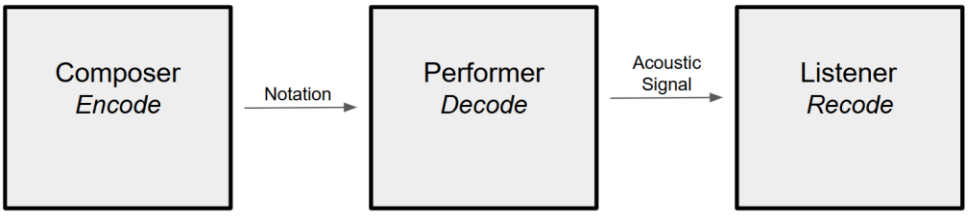
The third way a soundtrack can connect to the narrative of a given work is through *incongruence,* when the mood of the soundtrack is seemingly contradictory to the mood of the movie or video game's narrative. In contrast to the other two connections, which focus on presenting one clear narrative to the viewer, *incongruence* leads to two different simultaneous narratives being conveyed when watching a movie or playing a video game. Rather than simply having two narratives simultaneously occurring within the viewer's mind, these separate narratives are instinctively combined in order to create an entirely new narrative. Although it is widely considered the case that music in film in any form always "alters the meaning of a particular aspect of the film" (Lipscomb 2005), musical incongruence stands out as explicitly

calling attention to itself. With congruence and creation, the music serves a narrative function while being in the background of the viewer's mind.[10]

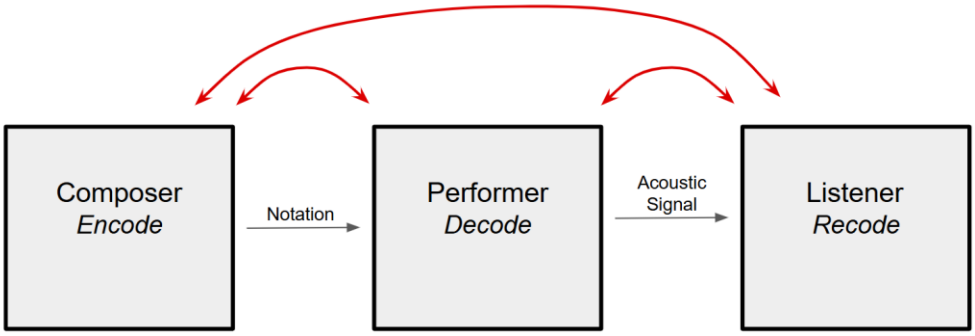
Technically, it is not possible for musical incongruence to exist in the mind of a viewer since, through the creation of a new combined narrative, the viewer will resolve the incongruence and make it congruent. Incongruence does not refer to when there is an irreconcilable contradiction in the audiovisual relationship, but rather when the viewer's prediction does not eventuate and therefore creates a feeling of surprise. When discussing the role that incongruency plays in comedy, Straßburger said it "requires the application of cognitive mechanisms that enable the recipient to detect the incongruency and reconcile the given mental model with the input to resolve the incongruency, extract a coherent meaning, and understand the joke" (Straßburger 2022, 51). The viewer cannot let two incongruent meanings exist independently; they will force them together, which is what results in incongruency. The more incongruency there is in the audio-visual relationship, the more the incongruency calls attention to itself, and the viewer will be more aware of it.

According to Jean-Jacques Nattiez, incongruency can be analyzed as a tripartite communication model (Nattiez 1992). When looking at music through a tripartite communication model, the process of communication is linear, going from composer (*Encode*) to performer (*Decode*), and finally to the listener (*Recode*), as seen in **Example 2.7**. (Kendall and Carterette 1990). As mentioned by Roger Kendall and Edward Carterette, this is how Western Art music traditionally functions, but in other types of music, this is not always the case. Depending on the music, different sections of the tripartite model can have different levels of participation, with the model not being linear anymore, as seen in **Example 2.8**.

[10] For more on incongruence in film music, see Ireland 2018, David 2023, Donnelly 2023, Oja 2024, Strick 2021, Sekar 2022, and Bottin 2024.



Example 2.7. Tripartite communication model for music.



Example 2.8. Demonstration of backwards interaction

Incongruity is one such instance where this occurs. The listener is forced to participate in the communication model with the incongruence, requiring them to employ higher-order cognitive processes: "This information can contextualize consideration of higher-order processes that may influence subjective judgments of congruence: for example, familiarity with genre conventions or a director's aesthetic can shape expectations about how film music may be used or how it may fit with concurrent visual and narrative content" (Ireland 2015). This active participation by the listener is reminiscent of *auteur theory*, a school of thought created by film critics who saw the director as the main creator of a film's meaning and themes. According to Peter Wollen, critics who employ auteur theory attempt to reveal "a core of meanings" and "thematic motifs" intended by the director (Wollen 2003). In this way, musical incongruency can be seen as an instance where auteur theory is forced upon the viewer, who must now participate

in the communication model and decipher what the intentions of the director are. This is why, as David Ireland says, an audience member's familiarity with genre conventions or a specific director's style will affect how they perceive the incongruency.

This is what makes musical incongruence both unique and difficult from an analytical standpoint: the incongruency present calls attention to itself, and the effect, while mostly predictable, can be entirely different depending on how the Listener recodes it.[11] As mentioned earlier, musical incongruence creates a level of audience participation. However, there are differing levels of incongruence which result in differing amounts of audience participation. This places incongruence on a gradient, with not all instances having as strong an audio-visual contradiction as others. As a result, during this thesis, when I observe an instance of incongruence, it is not strictly categorical, and I will mention if conflict is strong or weak.

David Ireland has identified one common musical incongruency that takes place in comedies, where the music is serious or dramatic in order to highlight the comedy (2023). Lena Straßburger has similarly discussed musical incongruency being an element in comedy, but compared its function in comedy to that of art horror, explaining how incongruency is commonly used in both genres to similar effect (2022). According to both of their research, there exist the following two types of musical incongruence in film:

1. Silly situation + serious/dramatic music = comedy

[11] With regards to incongruency being highly subjective, it is still the case that certain incongruities will have predictable effects. This is shown by Lena Straßburger, who shows that musical incongruence in comedy films is mentioned more by participants in the studies as being particularly funny (Straßburger 2022). David Ireland found that for certain types of musical incongruence, while there is a certainty that it will lead to increased stimulus, the effect can be different depending on the viewer. This is shown by a study conducted on the effect of musical incongruency present in *Fear and Loathing in Las Vegas,* where Vietnam War footage and protest are shown, accompanied by a version of *My Favorite Things* that is in a minor key (Ireland 2015).

2. Mundane situation + scary music = trepidation[12]

There are, of course, a much larger variety of combinations than this; these are just two common ones that appear in our media.

An example of the first combination (a silly situation + dramatic music = comedy) is the legendary SNL skit *Dear Sister,* produced by the comedy group *The Lonely Island*. *Dear Sister*, which aired in 2007, is a parody of a similar scene from the show *The OC*. At the beginning of the skit, Andy Samberg walks into a room where Bill Hader is sitting on a couch, writing. Andy asks what Bill is doing, and after responding that he is writing a letter to his sister, the video cuts to Andy aiming a gun while a gunshot rings out, and the song *Hide and Seek* by *Imogen Heap* suddenly starts playing. In a long, drawn-out manner, Bill Hader pretends to die all while cuts of Andy looking emotional are intercut, with neither of them showing any hint of amusement. This skit was aired live on *SNL* with a live studio audience, and at this point, the laughter from the audience is hesitant. This may be because at first it is unclear what the joke is, since the music is so dramatic and the actors are playing it straight. After the song fades out, Andy turns to leave, only for the video to then cut to Bill shooting Andy with *Imogen Heap* playing again. At this point, the melodrama is evident, but even though the situation is silly through repetition, the laughter is still hesitant, as if the audience does not know whether they should laugh or not. After the camera shows both Andy and Bill lying on the ground (apparently dead), Shia Lebouf walks in excitedly saying he thought of something funny, only for it to cut to Andy shooting him as the song restarts.

[12] This could be seen as a form of *creation* since the end result is more similar to the mood of the music than that of the given works narrative. The reasons this is not the case is that the mundane situation can often have its own narrative taking place, and also the combination of the mundane and the scary is what creates a heightened feeling of horror, more so than if the scary music was playing by itself.

It is only when this third shot is fired at Shia, who was so jovial and just walked in randomly, that a majority of the audience laughs since it has now become clear that they are supposed to find this silly. It is at this moment that incongruence occurs, since the situation has become silly enough that the dramatic music just makes the whole thing much more comical.[13] Much of comedy is said to come from tension and release, this being why many jokes come in the form of a set-up, a punchline, where the set-up is a question that the punchline answers. In this skit, the melodrama of Andy and Bill acts as a set-up that the incongruence acts as the punchline for, undercutting the drama of the music and making it fully a comedy.[14]

An example of the second combination is in the 2022 horror film *Barbarian.* A large portion of this movie involves the director using cinematic language in order to make the audience suspicious of the character Keith, a man who is renting the Airbnb that is supposed to belong to the main character. In a scene at the beginning of the movie, a woman pulls up to a house at night while it is raining. She looks at an Airbnb app on her phone and approaches the house to retrieve her keys from an electronic lock box, only to find that the keys are not there. She then notices that there is someone in the house, and after trying and failing to contact the Airbnb company, she knocks on the door, and the man, Keith, approaches to open it. Everything is being done to make the audience feel like something is wrong, be it through lighting, cinematography, and most of all, through the music. Before we even get to see Keith clearly, the music is very ominous with low, drawn-out strings, low synth bass, and elements of noise. This music cuts out when the door is opened, and we see what appears to be a normal-looking man, but the incongruence leaves the audience filled with trepidation as to the true nature of this man.

[13] This video can be seen here: https://www.youtube.com/watch?v=vmd1qMN5Yo0&t=99s
[14] It can also be said that the skit writers made a conscious decision to make the third shot create a silly situation since it follows the rule of threes. The first two shots could passably be considered serious as a set-up to the punchline of the third shot.

Without the ominous music, this could almost be seen as the beginning of a rom-com with a series of unlucky events occurring, leading to a woman and a man meeting. The music contradicts the benign nature of the narrative taking place and therefore creates a strong sense of tension and horror in the audience.[15]

Not all instances of *incongruence* fit neatly into one category; they can change throughout a scene as both the narrative and the music change. This is the case in the 2025 movie *Weapons* during a scene in the latter half of the film. *Weapons* involves a mystery where every student in an elementary school class disappears during the night, except for one lone student. Later in the film, the teacher of that classroom becomes concerned about the home life of the lone student and so calls for a welfare check with the principal. His secretary says the boy's guardian is here, and after saying she can come into his office, the music signifies tension with high strings as the principal watches a figure through the glass approach his office. This is an example of a mundane situation + scary music = horror, and the audience waits to see what figure is the source of this horror. When the figure walks through the doorway, we see an almost cartoonish caricature of an old woman, with gaudy clothes, large sunglasses, and a bright orange wig. This transforms the *incongruence* into a combination of a silly situation and dramatic music that creates a moment of comedy, which is aided by the look of confusion on the principal's face.[16] This demonstrates that musical *incongruence* isn't static, since the audio-visual relationship can constantly change to convey different narratives.

Incongruence will be one of the main focuses of this thesis, with *congruence* and *creation* being explained in order to demonstrate what makes *incongruence* unique.

[15] This scene can be seen here: BARBARIAN | Official Clip | In Theaters September 9
[16] This scene can be seen here: Weapons | Marcus Meets Gladys | Movie Clip | Warner Bros. Entertainment

Incongruence calls attention to itself and makes the listener (the *recoding* portion of the tripartite communication model) become more of a participant, leading to the combination of conflicting moods into new narratives in the mind of the viewer.

How a Synthesizer Works

Before discussing timbre, it is necessary to discuss the way a synthesizer works. This is because analyzing the timbre of a synthesizer is fundamentally different from analyzing the timbre of any other instrument, since the entire identity of the synthesizer is based on the fact that its timbre is customizable by a user. This is such an integral part of the synthesizer's identity that when people are said to be able to "play" synthesizer, it is often the case that what is actually meant is that they understand the controls of a synthesizer enough to be able to reliably create the timbre they want. The synthesizer's versatility was recognized early in its advent, being noted by Harold Bode as a way to create "new musical effects" (Bode 1961).

There are two main types of synthesis that are used by modern synthesizers: frequency modulation synthesis and subtractive synthesis. Frequency modulation synthesis (or FM synthesis for short) was invented after subtractive synthesis, due to it being possible through computers and digital synthesizers.[17] When synthesizers or sound synthesis are being discussed in this thesis, I am specifically referring to the subtractive synthesizers. This is due to my expertise and knowledge being limited to subtractive synthesizers.[18] FM synthesizers would

[17] Traditionally, sound synthesis was done through the use of oscillators that create electronic currents at certain frequencies that are then played through a speaker. In the '70s, digital synthesis was being worked on and, with its capabilities and limitations, frequency modulation was the way digital synthesizers could function, being much less hardware intensive than creating a whole synthesized sound that is then sculpted with filters.

[18] Though admittedly this is due to a bias on my part – I am an avid learner and practitioner of subtractive synthesis with not much experience with other kinds – I feel that an exploration of subtractive synthesis is more relevant to modern electronic music. This is because, with the advent of wavetable synthesizers and

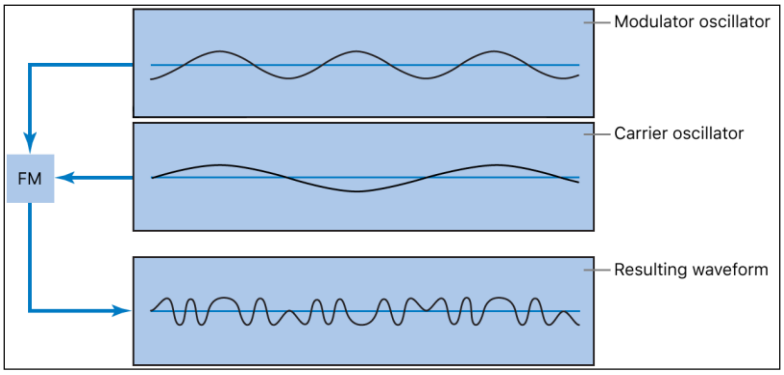
create sounds by having a main sine wave, called a *carrier*, that was then modulated by other sine waves, called *operators.* Similar to an organ, the *operators* would have to be tuned to frequencies that are in ratio with the frequency of the *carrier* in order to add in harmonics that would create a richer sound. Although, unlike an organ, the *operators* do not merely add in the notes they are tuned to, they add in these notes by modulating the *carrier,* which results in the sine waves interacting with each other to create strange shapes in the final soundwave. The advent of FM synthesis was noted by scholar Steve Saunders (1977) as both simple and versatile:

> In 1972, John Chowning at Stanford A. I. Lab invented a new method of synthesizing musical sounds that is both extremely simple and exceedingly versatile [Chowning]. Chowning's method consists of frequency modulation of a sine-wave carrier (at the desired fundamental frequency) by a sine-wave signal at the same or a closely related frequency.

The need for a computer was a limitation for FM synthesis, but the advent of hardware digital synthesizers in the late 70's and the versatility/simplicity described by Saunders led to a spike in popularity in the 80's. A visual example of how FM synthesis works can be seen in **Example 2.9**.

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their increased popularity due to dubstep, subtractive synthesizers are much more common in today's sonic landscape. This is especially the case with soundtrack music.



Example 2.9. An example of how a *carrier* oscillator interacts with an *operator* oscillator that is tuned to double the frequency of the *carrier.*

Subtractive synthesis is the process of an oscillator generating a sound wave that is then sculpted in order to create a desired sound. In contrast to an FM synthesizer that only generates sine waves, oscillators in subtractive synthesizers can generate a large variety of sound waves that have full timbres with a lot of harmonics present. This is due to subtractive synthesizers using analog circuits that use electric currents to directly create the desired soundwave.[19] The four most common sound waves that almost every synthesizer can produce, named after the shape they create in an oscilloscope, are a sawtooth, square, triangle, and sine wave.[20] This sculpting is done by routing the oscillator to a filter that can remove different frequencies depending on the synthesizer, the most common being a low-pass filter that removes higher frequencies, and a high-pass filter that removes the lower frequencies. Both the oscillator and the filter can be modified by routing them through an envelope generator commonly referred to as an ADSR. This stands for attack (how fast the onset of the sound is), decay (how quickly the

[19] Modern subtractive synthesizers often actually use digital oscillators, though them being subtractive they are operated identically to a synthesizer that use analog synthesizers.
[20] In recent times with the prevalence of virtual synthesizers, a near infinite variety of wave types are possible with the advent of "wavetable synthesis". This allows users to manually create a sound wave by drawing any shape they want with their mouse in the program. Most other functionalities are the same as in a hardware synthesizer, each other.

volume drops to the designated sustain level), sustain (how quiet the sound becomes after reaching the peak of the attack), and release (how quickly the sound dissipates after the key is released). Note that the envelope generator can not only affect the volume, but the filter as well, meaning that the resulting spectral timbre can change over time. From this point, the sound is routed to an output that then generates the sound, but there is another module that is present called a Low Frequency Oscillator, or LFO for short.

LFOs, as the name suggests, create very slow AC waves that can be routed to modulate other modules to varying degrees, such as volume, pitch, and filter frequency, and even other LFOs. This means it is easy to have any part of a synthesizer's sound be modulated, either in a constant way, like by using an LFO to apply a sine wave to the pitch to create vibrato, or in completely unexpected ways, like by routing several LFOs into each other at different frequencies and then routing them all into the filter. This means that synthesizers have a timbral quality that is not present in most other instruments: the ability to change over time without a new attack.

After all of the modules in a synthesizer are set by the user, the resulting sound is referred to as a “patch” in reference to the original synthesizers that required users to literally connect modules together through the use of patch cables. The terminology and functionality of synthesizers can be fully learned in an online tutorial created by Gordon Reid (1999). Understanding the terminology involved with synthesizers can help understand and describe the resulting patches' timbre, with descriptive adjectives such as bright and dark being directly tied to the type of sound wave being generated, as well as whether or not a low-pass/high-pass filter is being used.

Describing Timbre

One of the most prevalent issues with timbral analysis is that, unlike harmonic analysis, it is difficult to create objective labels for timbral qualities. Leonard Meyer described this issue by creating two categories of musical elements: primary parameters that fall into "discrete, nonuniform relationships so that similarities and differences between them are definable, constant, and proportional," and secondary parameters that have processual relationships and are syntactical instead of statistical (Meyer 1989). In harmony, there are codified terms and labels for which notes make a chord and how they relate to a home key, meaning it is usually clear when a V chord is a V chord. Dynamics, in contrast, are nearly impossible to quantify in a meaningful way, being reliant on the relative volume of different sections of a song. James Donaldson has since expanded on the idea of primary and secondary parameters, putting forward ideas about ways that primary parameters can be combined. An example he puts forward is both harmony and timbre, both of which are made up of multiple data points that fall within primary parameters, that being pitch values (Donaldson 2021). In this way, the V chord described earlier is a concept made through the combination of multiple primary parameters, with timbre being the same, in that we can quantify the overtones present in any sound by running it through a spectrogram. The problem with timbre arises when attempting to assign a descriptor to the timbre, rather than noting the exact frequencies present. When describing timbre, we often rely on metaphorical descriptors such as *bright, hollow, brassy,* etc. In order to quantify timbre in a meaningful way, one can designate a specific timbre as "neutral" that other timbres can be compared to, in order to assign descriptive adjectives to it. Megan Lavengood designated the clean electric guitar as a neutral timbre in order to assign markedness to other timbres, though she specifically mentions that context matters and that she is "taking pop music of 1950–1990 as

(her) context" (Lavengood 2020). Her reason for this is both because of the prevalence of the clean electric guitar in her chosen context, but also because it can evoke a large variety of genres in contrast to a distorted guitar, which is more limited in that regard: "The distorted guitar signifies a narrower range of genres than the more flexible undistorted sound" (Lavengood 2020). Lavengood expands upon oppositions by Robert Cogan (1984) to describe certain timbral aspects as "marked"—i.e., different from the "neutral" timbre—and others as "unmarked"—i.e., the same as the neutral timbre.[21] Originally, Lavengood's expanded binary pairs were used in order to designate marked timbres in popular music, and they've also been used as a pedagogical tool to teach how to recognize and label specific timbres.[22]

In this thesis, I will use the oppositional pairs to describe timbres, focusing less on whether each value is marked or unmarked. Following Lavengood's timbral analysis lesson plan (2025), I create a table of these pairs that includes all the instruments present in any given piece of music. I will then compare these instruments' timbres and assign them one of the two adjectives from the pair. Whether or not they fall within the first or second descriptor will be determined relative to the other instruments present in the piece of music. For example, if there were a piece of music written for cello and viola, then the viola would be assigned a "*bright*" for bright/dark, not because it is a bright instrument, but because it is the brightest instrument present in that piece of music. If there is the case of an instrument that lies between the others in terms of an adjective pair, such as a viola being paired with a cello and a violin, then a judgement must be made of which of the other instruments timbres it is closer to. In this case, the

[21] The organization of the descriptive adjectives into binary pairs plays into the relativity of timbral analysis while also utilizing the fact that many of the adjectives we use to describe timbre naturally have an oppositive, i.e.. bright vs. dark, hollow vs. full, etc.

[22] Megan Lavengood created a lesson plan for using EDM (Electronic Dance Music) in order to teach timbral analysis to undergraduate students. The lesson plan, including handouts that list the binary pairs, can be found here.

viola would be described as bright since its brightness is closer to the violin than it is to the cello. The assignment of adjectives will be subjective and based on my judgments.

Megan Lavengood separates the timbre of the sustain and the timbre of the attack when describing the binary adjective pairs for identifying timbre. This is because not all instrument timbres remain unchanging as they progress; certain ones are defined by their timbre changing, such as a snare drum that has a bright and noisy attack with a dark and pure sustain. The adjective pairs that Lavengood outlines for the timbre of the sustain are as follows:

1. *Bright/Dark*
2. *Pure/Noisy*
3. *Full/Hollow*
4. *Rich/Sparse*
5. *Beating/Beating*
6. *Harmonic/Inharmonic*

For the timbre of the attack, Lavengood includes Bright/Dark while only including one new binary pair: *Percussive/Legato*. In this thesis, the adjective pairs that will not be included are Rich/Sparse and Harmonic/Inharmonic. For harmonic/inharmonic, this is because when it comes to subtractive synthesis, the soundwaves generated will only include overtones that are a part of the harmonic series, and so there will not be synth timbres that are inharmonic. For rich/sparse, this is because the way overtones are omitted from a soundwave is through the use of a filter, which will either get rid of the higher soundwaves or the lower soundwaves. This effectively means that making a synth timbre darker will make it sparse, and vice versa with bright and rich timbres. For this reason, in order to avoid redundancy, since all dark timbres will be sparse and all bright timbres will be rich, I will not be including the rich/sparse adjective pair in my

analysis. In the following section, I will briefly summarize the adjective pairs that Lavengood (2020) outlines in her paper while highlighting alterations I have made in order to pertain more specifically to synthesizers.

Timbre of the Sustain

Bright/Dark

The brightness/darkness of a timbre is determined by the spectral centroid, the weighted average of all of the harmonics present. With synthesizers, this is relatively simple to determine since most synth sounds are created by using filters to remove high frequencies. This results in different synth patches in the same music being relatively easy to order from darkest to brightest.

Pure/Noisy

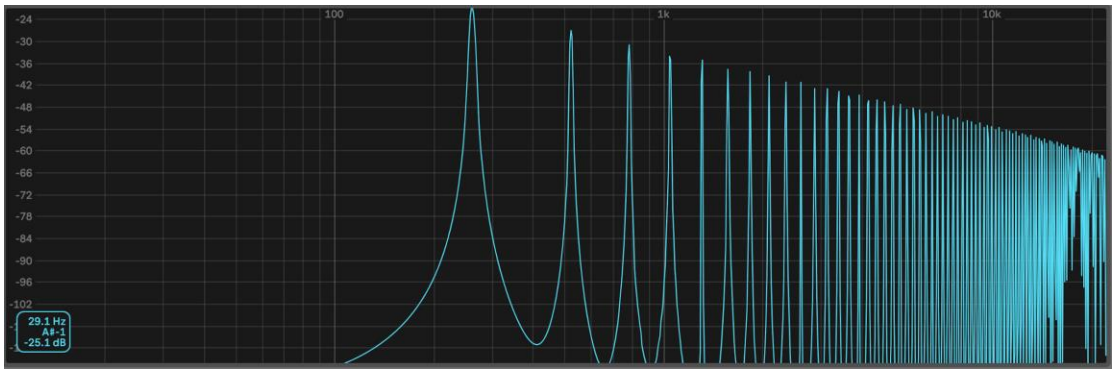
This adjective pair pertains to the presence of non-pitched frequency clusters in the timbre. With recorded music, there is often an element of noise present that is related not to the instrument used but to the process of recording it. A common technique in music production is adding tape distortion or other effects that result in instruments introducing noise when they increase in volume. With synthesizers, there is often an oscillator specifically designed to generate white noise that is then affected by the filters and envelopes being used in the patch. Noise is easy to detect by ear, with the volume of the noise determining whether it is relatively pure or noisy in the mix.

Full/Hollow

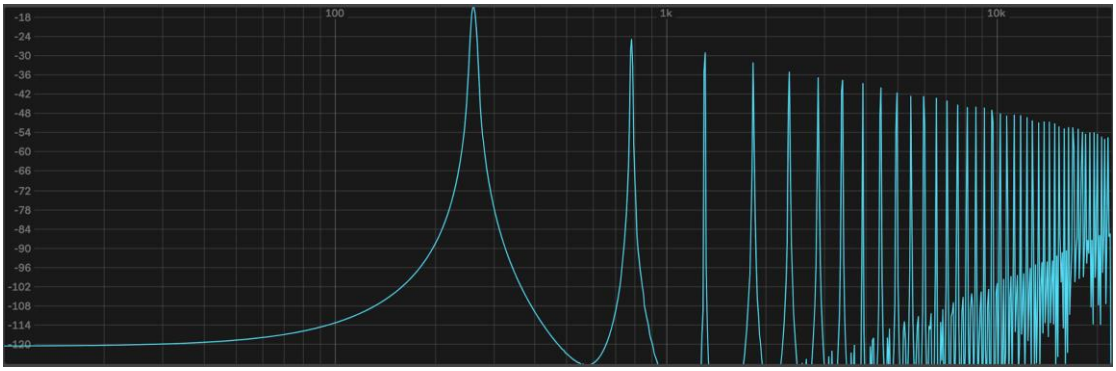
An instrument is considered full when most of the frequencies that are in the harmonic series are present in an instrument's timbre. For synthesizers, there is not a way to sculpt a sound to make it fuller or more hollow. Low-pass filters remove any frequencies above the set frequency, and high-pass filters remove any frequencies below the set frequency. The only way fullness can be customized is through the user's selection of a starting soundwave in the oscillator. Both triangle waves and square waves only have odd-numbered overtones, but the overtones present in a triangle wave are constantly diminishing. This is why a square wave, when run through a low-pass filter, sounds similar to a triangle wave. The square wave is often considered to be more hollow than the triangle wave, which is difficult to parse since they have the same harmonic content. This implies that different timbral attributes can influence each other, with the brightness of the square wave making it more hollow than the darker triangle wave. For the purposes of this paper, the order of the standard soundwaves from hollowest to fullest is as follows: triangle wave, square wave, sawtooth wave.[23] These sound waves can be heard in **Audio Example 2.3** and seen in **Examples 2.11**–**2.12**.

> **Audio Example 2.3.** An audio file that plays a square wave, triangle wave, and sawtooth wave in that order.

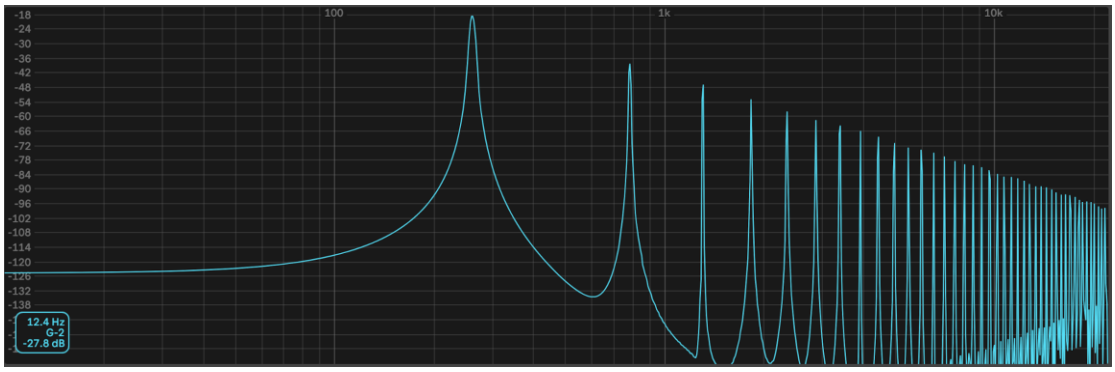
[23] The reason that the sine wave is not included in this ordering is that it is a single tone without any additional overtones. This means there are not any overtones to include or omit, so technically, through the metrics of Full/Hollow, this would make the sine wave full since there are not any overtones to exclude. Simultaneously, however, there is the fact that as shown with the square wave, the increased volume/presence of overtones can make a sound become more hollow. This places sine waves as both full and hollow, and so for the purposes of this paper, when analyzing synthesizer patches that use a sine wave I will not use the Full/Hollow pair.



Example 2.10. An equalizer display of the overtones present in a sawtooth wave.



Example 2.11. An equalizer display of the overtones present in a square wave.



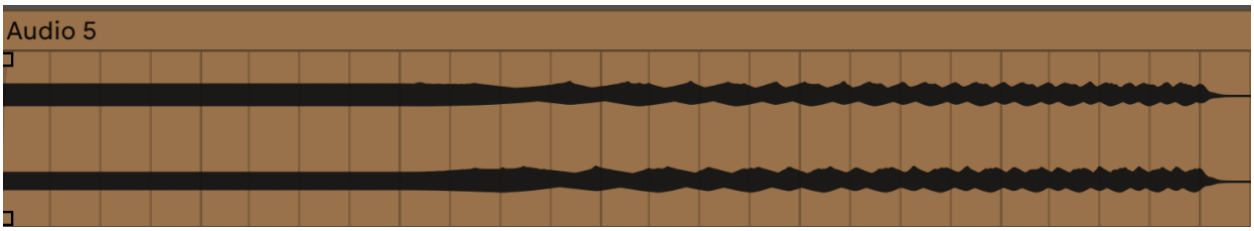
Example 2.12. An equalizer display of the overtones present in a triangle wave.

Beatless/Beating

When two sounds are close to the same pitch but have slight differences in their Hz values, beating occurs. This is most evident when two of the same instruments are playing the same note

but are slightly out of tune. This is usually not a factor in the timbre of an instrument since it requires multiple acoustic signals to be generated at once, the most obvious example being a piano, which has multiple strings being struck for a single note. For synthesizers, introducing beats is a common practice. This is often done through the introduction of multiple oscillators all playing the same note that are then slightly detuned in order to create a kind of chorus effect. A demonstration of the effect this creates can be heard in **Audio Example 2.4** and seen in **Example 2.13**.

Audio Example 2.4. An audio example of a synth playing a sawtooth wave that increasingly becomes detuned.



Example 2.13. A visual representation of the sound wave as it becomes increasingly detuned.

This sound was created by using the virtual synthesizer Surge XT and programming the oscillator to generate four sawtooth waves. Then, over time, the detuning slider was increased, causing the four sawtooth waves to have their Hz values altered, straying from the correct note. The effect can both be seen and heard, with regular rhythmic beating being introduced that

increases in speed as the oscillators further stray in tuning. This means that, in order to determine whether a synth patch is beating or beatless, listening for a chorus effect[24] makes it much easier.

Timbre of the Attack

Percussive/Legato

As opposed to percussive/legato being determined by the overtones present in any given sound, it is determined by the time between the onset of the note and when the volume reaches 100% amplitude. For example, percussion instruments and piano are percussive, and wind instruments would be legato. With synthesizers, what determines percussive/legato would be the setting on the ADSR of the envelope generator, specifically with the attack.

Bright/Dark

This is the same as with the bright/dark pair in the *timbre of the sustain* section, although this time it is in regard to the attack of the sound. As explained earlier in this thesis, envelope generators can modulate the filter as well as the amplitude of the oscillator, and so the attack and the sustain having different timbres is relatively common in synthesizer patches. This is specifically true for patches that have short percussive notes, with the perceived length of the note being created by an ADSR envelope, making the onset of a note bright and the sustain dark.

[24] A chorus effect is an effect that has existed for decades, first in the form of guitar pedals. A chorus effect takes an acoustic signal, alters the tuning and timing, and then introduces the altered acoustic signals along with the original one. The effect is that it sounds like there is more than one instrument playing the same note, hence it being named a chorus effect. This effectively creates the same sound as detuning in a synthesizer and is often used in conjunction with it, therefore for the purposes of this paper both detuning and chorus will be designated as beating.

Timbre as Embodiment and Metaphor

The binary adjective pairs serve as a useful tool in order to identify and describe the timbre of different instruments, but there remains the issue of what the different timbral attributes signify. A noticeable pattern with descriptors for timbre is the prevalence of metaphorical language, a trend that is present in much of music scholarship: "the presence of metaphors in academic discourse on music (29%) is significantly higher than in academic discourse in general (19%)" (Perez-Sobrino and Julich 2014). Zachary Wallmark states that "human meaning is both facilitated and constrained by the experience of having a (human) body" (Wallmark 2022, 63). This is the reason he posits for the use of sensory-based metaphors in "higher levels of human understanding, including language, imagination, and reasoning." Mark Johnson built upon Immanuel Kant's concept of a *schema* ("a procedure of imagination for structuring images in accordance with concepts") to create the idea of an *image schema*, which are "recurring patterns of our sensory-motor experience by means of which we can make sense of that experience and reason about it, and that can also be recruited to structure abstract concepts" (Johnson 2005, 17–19). This is based on the idea of the mind and body being one and the same, rejecting the idea of duality where our consciousness is an independent entity. When we hear a sound, we will automatically process that sound in our mind through an image schema by relating it to our bodily senses: "The coherence of meaning attendant to timbre descriptors, despite their apparent ambiguity, betokens certain consistent, shared patterns of underlying bodily experience. How do we know these descriptive qualities other than with the senses? The way we talk about timbre both discloses aspects of the underlying physical dynamics of sound production and perception and enacts the somatic implications of sound" (Wallmark 2022, 62). This is the reason that sound-source identification is almost unavoidable when it comes to describing timbre; we can't

help but try to picture the object making the sound, what it looks like, how it feels to play, how big it is, where it is in relation to us, and how it would feel to try to make that sound with our voice. This is connected to the reason that music is able to convey/elicit emotion at all.

Music (and noise in general) is able to elicit the image of certain activities through cultural association, and we then embody those activities, creating an emotional response. Cognitive Science professor Mark Changizi posited as much when research showed that music that is widely considered to be happy or sad can affect their perception of how happy or sad a simple stick figure's face is: "if music sounds like human expressive movements, then it sounds like something that, all by itself, is rich in emotional expressiveness, and can be easily interpreted by the auditory system" (Changizi 2009). When looking at timbre through an image schema, not only do we process a timbre through the embodiment of its creation, but we will also be reminded of the cultural associations of a sound that we will then embody as well.

Zachary Wallmark describes timbre through what he calls the ASPECS model. ASPECS stands for: Act, Sound, Perception, Experience, Concept, and Sign (Wallmark 2022, 17). Although the tripartite communication model is not directly referenced, it is clear that ASPECS is inspired by it, with Act-Sound-Perception being the three parts of the tripartite model, with Experience-Concept-Sign being subdivisions of Perception. In this way, Wallmark's ASPECS model places the focus on the processes undergone by the listener during communication. Experience, according to Wallmark, refers to the *image-schematic* engagement that occurs when hearing sounds, referring to the conceptualization of sound through the use of "repositories of bodily experiences." Concept is used to refer to the reflection of our experiences, where we determine patterns and semantically organize them. This is why we often use metaphorical adjectives to describe sound since, as mentioned by Wallmark, "timbre lacks its own domain-

specific vocabulary" (19). Wallmark's use of sign is borrowed from semiotics and refers to when timbre is used to represent a socially/culturally learned meaning. As stated by Wallmark, the meaning of timbral signs is often ambiguous and dependent on both the listener and the context, and so specific timbres cannot be easily ascribed to universal meanings: "When qualities of timbre are conventionalized into signs, meaning becomes polymorphous and highly malleable according to context" (20). Through the ASPECS model, embodiment, metaphorical descriptors, and culturally assigned meaning are all shown to be a part of a singular process through which a listener understands timbre.

To illustrate, in the Pink Floyd song "On the Run," there is a repeating fast-moving synth line accompanied by a hi-hat being played in 16th notes. Distorted, noisy synths fade in from the left and fade out to the right, sounding like they are passing by you overhead, and they have filter and volume modulation that causes them to create rhythms contradicting the song's tempo. The main synth is dark with the hi-hat being bright, but both have a full timbre. The fullness of both timbres creates a sense of the sounds being dense and compact, creating a sense of momentum. The dichotomy of brightness and darkness in the timbres creates the sense that both are, in connection to the title of the song, running, with the synth chasing the hi-hat. This is because the hi-hat remains constant in the timbre, with the synth often becoming brighter and more modulated before fading away again, making it sound like it is getting closer to the listener before they manage to gain some distance again. This is understanding the timbre itself through embodiment, but the interpretation is further reinforced through cultural connotations. The noisy, distorted synths that are modulated to create contradictory rhythms evoke the image of helicopters that are sometimes distant but will then pass by closely. This fleshes out the image of

being chased by painting a scene where the listener is running away from some mysterious entity, while other dangers are looking for them that they must avoid as well.

The last three sections of the ASPECS model, that being experience, concept, and sign, provide a framework in order to analyze timbre. In this thesis, I will use this framework in order to assign semiotic meaning to timbre when used in the context of soundtrack music.

Timbral Incongruence

As explained earlier in the *Incongruence* section of this thesis, musical incongruence is when there is a conflict of properties in the audio-visual relationship in a movie or video game. When it comes to *timbral incongruence*, this is when the conflict is with the timbre of the soundtrack and the narrative/mood of the given work. When watching a movie or playing a video game, the participant will very often have physical reactions as they are exposed to the stimuli. An example of this is during fight scenes in movies or while fighting someone in a game, the viewer will put themselves in the place of the characters and start embodying their experiences, feeling the stress and exertion themselves. Compare this to a scene where a character loses a loved one, a viewer might become sad and, seeing the character cry, will tear up themselves. As explained in the previous section, timbre can, through embodiment, cause very real physical and emotional responses when perceived. When the narrative of a given work and the timbre of its soundtrack would cause the perceiver to have to embody contradictory states, that is when timbral incongruence occurs. Very often, if there is musical incongruence taking place in a movie or video game, the timbre is contributing to it. There are situations, however, where other aspects of the music, such as harmony and melody, do not create a contradiction, but the timbre does. This is when timbral incongruence takes place. When attempting to decide whether timbral

incongruency is happening, the most audible timbres of the soundtrack can be assigned adjectives from the timbral binary pairs. Then, what these adjectives signify (or, in other words, how they act as *symbols*) can be compared to the narrative/mood of the given work. If there is a clear contradiction, then timbral incongruence is what is occurring. The timbral attributes in the describing timbre section can all signify both through culturally learned connotations and through embodiment. Attempting to assign their symbolic meanings runs the risk of being reductionist, and so, for the purposes of this paper, what a timbral adjective signifies will be discussed case by case, depending on the timbres present in the piece being analyzed.

An example of *timbral incongruence* can be heard in the 2006 movie *Marie Antoinette. Marie Antoinette* follows the story of the titular character as she is sent off to France in 1770 to marry King Louis XVI. One aspect of the movie that is often noted is that it does not feature an original soundtrack; it uses recordings of classical music and licensed popular music instead. One song used in the film is "I Want Candy" by Bow Wow Wow, heard during a scene where Marie Antoinette is enjoying going through all the clothes she has acquired due to her being queen. This itself is an example of *timbral incongruence*, with an inclusion of a drum kit and distorted guitar being anachronistic to the time period and immediately calling attention to themselves. If, during this scene, up-tempo classical music in a major key was played, then this would still work for the scene and show us that Marie is enjoying her time trying on her new clothing. The use of "I Want Candy" creates an instance of *timbral incongruence*, where the viewer now views Marie as living the life of a rock star, and starts to view her from that angle, rather than viewing her as a posh member of royalty. This is in line with an analysis of the film by Suzanne Ferriss and Mallory Young, who discuss how the evocation of "chick culture" is used to "present a third-wave feminist aesthetic focused on youth, fashion, sexuality, celebrity,

and consumerism" (Ferriss and Young 2010). Even if the rock song were an original composition that used completely different chords and melodies, the incongruency would still be the same because it is the *timbre* of a rock song that creates it. There is, of course, the fact that the use of a rock song in a movie set more than one-hundred years in the past creates an anachronism through the use of genre that is arguably stronger than the timbral incongruency. Timbral incongruency is still present and can exist alongside incongruency created by other music elements.

Marie Antoinette is shown in the film to have been raised in Austria, where her lifestyle was conservative and her surroundings holy and ancient. Most of the movie shows her transformation into a rock star of the time, influenced by the extravagance and party culture of the French nobility. Earlier in the film, there is a scene where Marie Antoinette first arrives at Versailles, the effective royal palace of France, during the time the movie is set in. Up to this point, we have heard classical music that, although it is anachronistic due to being written after the time period in which the movie is set, is what a viewer would expect from a period piece. When Marie and the audience are first shown the inside of Versailles, the piece "Jynweythek" by Aphex Twin is heard. This piece of music is immediately noticeable for having strange timbres, with *noise* and *brightness* only during the attack. This piece was performed by a prepared piano, which is a technique popularized by John Cage where small items, usually made of metal, are inserted between the strings of a piano. This alters the timbre and ADSR of the piano, all while introducing noise due to the inserted items rattling when the strings are struck. Even without knowledge of the sound source, Jynweythek is noticeably out of place due to its timbre. This is an instance of *timbral incongruence*, with the strange timbre reflecting how the character Marie Antoinette feels entering into this strange, almost alien world of glamour and luxury.

An example of *timbral incongruence* with synthesizers can be found in the 2018 movie *Eighth Grade*. *Eighth Grade* follows thirteen-year-old Kayla as she navigates the modern social media landscape while graduating from middle school. One major plotline is that Kayla has a crush on a boy named Aiden, who is considered one of the "popular kids". The way this plotline is introduced to this plotline is through the use of *timbral incongruence*. Early in the film, there is a scene where Kayla is sitting in her classroom while kids are called up for yearbook awards, such as best dressed and most likely to succeed. Aiden is called on because he has won an award, and as he rises, the ambience of the classroom fades, and the soundtrack takes over. What we hear is loud, punchy drums, a dark, repeating bass line, and noise in the form of a "faller", a common technique in EDM where the arrival of a section is marked by white noise that is run through a bandpass filter that starts at a high frequency and moves downwards. This scene, along with the music, can be seen in **Video Example 2.1.**

Video Example 2.1. A video showing a scene from Eighth Grade (2018). The main character, Kayla, is shown to turn towards Aiden, who then stands up as the music starts.

Since the piece of music only involves the repetition of one note, there is not much value in melodic or harmonic analysis. The real answer lies in the mismatch between the situation taking place and the genre of the music. The music heard is Electronic Dance Music (aka EDM), more specifically, a sub-genre of EDM often referred to as "Cyberpunk". Cyberpunk music is inspired by the literary genre of Cyberpunk, which features dystopian futures where corporations are the new monarchies, the masses are destitute and forced to live in apartments the size of coffins, and the only way to rebel is to disfigure yourself with robotic augmentations and fight back. Cyberpunk music is heavy and distorted, and it appears in this scene in *Eighth Grade*,

creating a moment of incongruence that creates a comical effect. As explored by David Blake, in the modern musical landscape, one of the key differentiators between genres is timbre (2012). With this small sample of music, there is not anything about the melody or the chords that indicates the genre, since there is only one note present that is being repeated. What indicates the genre in this case is purely the timbres present, which all signify a feeling of intensity that is not present in the scene's narrative; therefore, this is an instance of *timbral incongruence.*[25] This moment of *timbral incongruence* is an example of mundane situation + dramatic music = comedy, as described by David Ireland (2023), but it also serves a narrative function. At the point this scene takes place in the film, we have not been made aware of the character of Aiden or the fact that Kayla has a crush on him. The *timbral incongruency* in this scene, therefore, serves an expository function by conveying to the audience the fact that Kayla has a crush on Aiden and that it is an intense one.

Leit-timbre

A leitmotif, as explained earlier in this thesis, is a technique where a motif is representative of a person, place, or thing in a narrative. In the same way a melody can be used to do this, there has been scholarship researching the application of timbre in the same way. This concept is called *leit-timbre,* with much of the research being within Russian academia. This is discussed by Joan Titus, who analyzed the use of leit-timbre in the film music of Dmitri Shostakovich that had been discussed by Russian scholars previously (Titus 2016). Leit-timbre has also been discussed by Chelsea Oden, who analyzed how it interacts with embodiment in film music, with examples

[25] This incongruence is present even without knowledge of Cyberpunk music, since all of the timbres present are harsh, distorted, and overall feel like they had fit better in an action scene.

such as the use of talking drums in the movie *Black Panther* that are used to signify the fictional African kingdom of Wakanda (Oden 2021). In both of their analyses, leit-timbre is identified by naming the instrument used. Titus focuses on the use of certain instruments to signify narrative elements, while Oden focuses on how the use of leit-timbre interacts with embodiment in order to reinforce elements of a narrative. One of the most famous examples of leit-timbre, which also follows the trend of focusing on the sound source, is in *Peter and the Wolf* by Sergei Prokofiev.

In this composition, a narrator tells a story that is regularly interrupted by music from an orchestra that is supposed to reflect the situation that was just told by the narrator. Each character is represented by a different instrument, with each character's introduction also playing a specific motif. Later on in the composition, when the narrative situation changes, different melodies are played, but the instruments present let the audience know which characters are involved in the scene. It is also possible to identify *leit-timbre* without relying on instrument identification. This is most easily identifiable when analyzing synthesizer timbre, since there is not the availability of sound source identification, but it is also possible with acoustic instruments. In order to do this, the binary adjective pairs for timbre identification can be used.

An example of *leit-timbre* can be found in the 2004 puzzle video game Pikmin 2 for the Nintendo GameCube. In Pikmin 2, the player takes control of Captain Olimar and his partner, Louis, as they explore a future Earth to collect treasure with the help of the titular pikmin, small carrot-like creatures that can carry objects and attack the hostile wildlife. The game follows a cyclical structure where each day, you land in a zone of your choice and try to collect as much treasure as possible before it ends. Each area in the game has its own song that plays, but depending on what is taking place, the music can change in subtle and sometimes not-so-subtle

ways. In the area Awakening Woods, a song made up almost entirely of synthesized brass instruments is heard. A portion of this music can be heard in **Audio Example 2.5.**

Audio Example 2.5. The first couple of seconds of the Awakening Woods theme from Pikmin 2.

As mentioned earlier, there are variations on each song in order to convey what is happening during gameplay. One of these is called the "work" variation, which plays whenever the player is near pikmin that are carrying an object or doing some other kind of job. There is a pattern in the work variation of all songs where percussion instruments are added. An example of this for the Awakening Woods theme can be heard in **Audio Example 2.6.** In the work variation, there are only three instruments present: the timpani, low brass, and high brass.[26] Later on, strings and a percussive xylophone-like synth are added. This can be heard in **Audio Example 2.7.** A table of the instruments present as well as their timbres can be seen in **Table 2.1**.

Audio Example 2.6. Same portion of the Awakening Woods theme from Pikmin 2, but with added timpani.

Audio Example 2.7. The Awakening Woods working variation when more instruments are added.

[26] The horns heard in this song are midi samples and so it is not clear what the actual original instrument, if any, was used to create the sound.

TIMBRES	High Brass	Low Brass	Timpani	Strings	Xylophone
Sustain					
Bright/Dark	*Bright*	**Dark**	**Dark**	*Bright*	*Bright*
Pure/Noisy	*Pure*	*Pure*	*Pure*	*Pure*	*Pure*
Full/Hollow	*Full*	*Full*	*Full*	*Full*	*Full*
Beatless/Beating	***Beating***	***Beating***	*Beatless*	*Beatless*	*Beatless*
Attack					
Percussive/Legato	**Legato**	**Legato**	*Percussive*	**Legato**	*Percussive*
Bright/Dark	*Bright*	**Dark**	*Bright*	*Bright*	*Bright*

Table 2.1. The instruments present in Awakening Woods and their timbres.

The spread of the types of timbres present in the instruments is varied, but one aspect of the timpani that is not found in the other instruments is the fact that it has a dark sustain while having a bright attack. The instrument with the most similar timbre to the timpani is the synth bells, but the synth bells remain bright and have a much shorter duration. This would imply that a bright attack and dark sustain are what signify work, but this would need to be present elsewhere in the soundtrack to confirm this.

Another area in Pikmin 2 is the Valley of Repose, which is the first area of the game that the player starts in. Being a winter level, the instruments present are those typically found in video game winter levels, such as metallic percussion instruments (Lavengood and Williams 2023). The base of the song is made up of sleigh bells, glockenspiel, and low strings, all of which can be heard in **Audio Example 2.8**. In the working variation, the only added element to the beginning of the music is the inclusion of what sounds like a marimba. This version can be heard

in **Audio Example 2.9.** A table of the instruments present as well as their timbres can be seen in **Table 2.2**.

Audio Example 2.8. The Valley of Repose theme without any variation.

Audio Example 2.9. The Valley of Repose working variation with added marimba.

TIMBRES	**Sleigh Bells**	**Glockenspiel**	**Low Strings**	**Marimba**
Sustain				
Bright/Dark	*Bright*	*Bright*	**Dark**	**Dark**
Pure/Noisy	**Noisy**	*Pure*	*Pure*	*Pure*
Full/Hollow	*Full*	*Full*	*Full*	**Hollow**
Beatless/Beating	*Beatless*	*Beatless*	*Beatless*	*Beatless*
Attack				
Percussive/Legato	**Legato**	*Percussive*	*Percussive*	*Percussive*
Bright/Dark	*Bright*	*Bright*	**Dark**	*Bright*

Table 2.2. The instruments present in the Valley of Repose theme and their timbres.

In both of the work variations of the music, a percussion instrument is added. Percussion instruments require someone to strike them in order to create sound. The embodiment of their timbre, therefore, elicits the repetitive motion of continually striking them. There is also the cultural link between drums and the military, with drums being used to signify marching and conflict (Norris 2014). This military connotation is strengthened by the fact that you play as a captain and the pikmin are often referred to as your army. This is not sufficient to categorize this as a leit-timbre, since there are percussion instruments present in many of the main area themes. When looking at Tables 1 and 2, both the marimba and the timpani have one trait in common that none of the other instruments have: they both are percussive instruments that have bright attacks and dark sustains. Even when other percussion is already present in an area theme, they

will have bright attacks and bright sustains. Another instrument often used in work variations is the snare drum, which also shares the trait of having a bright attack and a dark sustain. While other elements of the timbre change, these two descriptors remain applicable. The combination of a bright attack and a dark sustain, therefore, functions as a leit-timbre that lets the player know that their pikmin are lifting an object for them nearby. There is also the connection of percussion being added during work variations, but there is percussion included in the standard themes, so it doesn't work to say that percussion alone functions as a leit-timbre for the pikmin working. It is shown that percussion instruments with bright attacks and dark sustains function as a leit-timbre for the work variation.

For every level theme in the game, there is a unique instrument that is added for each variation. One kind of variation that uses the same instruments in every level theme is the sunset variation. As mentioned earlier, the point of the game is to collect as much treasure as possible before the day ends, specifically before the sun has fully set. When the day is about to end, the sunset variation plays. Rather than adding instruments to the default level theme, the sunset variation replaces all of the instruments of the default theme with a music box. An example of this can be heard in **Audio Example 2.10.** The use of a music box is distinct as it is not used in any other place in the soundtrack other than in the sunset variation of every level theme. It being used in this way makes it function as a leit-timbre since it is the change of timbre that is signifying to the player that they must hurry and finish what they need to do before they run out of time.

Audio Example 2.10. "Awakening Wood: Sunset Variation" is an example of the timbre used in the game level themes when approaching sunset.

The use of a music box in the sunset variation serves as an example of timbral incongruence since it does not match the mood that the game's narrative is conveying. If the player does not retreat to where their ship is parked before the day ends, then all pikmin currently with them will die, with the player being shown a cutscene of Captain Olimar flying away while their pikmin are eaten by the creatures roaming the surface. This is obviously a harrowing experience, especially for children who are the intended audience. The use of a music box for the sunset variation evokes ideas of sleep, comfort, safety, all of the things that one would expect to be the case in a child's room. This makes the timbre of the sunset variation contradict the narrative of the game and creates timbral incongruence.

This could be seen as a confusing use of incongruence since, unlike in other examples shown previously, the conflicting moods do not end up enhancing each other or create a new narrative. Instead, the use of a music box undercuts the tension one would feel normally when approaching the end of a timer. I would argue that this is, in fact, a different way that incongruence can be used, as a way to lessen emotional highs and to make it more palatable. The end-of-day timer and its consequences run the risk of making the intended audience of children likely too scared to play the game, and so the sunset variation signifying peace and rest serves as a way to undercut the tension and make the gameplay experience overall less stressful and more enjoyable.

Outer Wilds

The video game *Outer Wilds* was released in 2019 and demonstrates both the use of leit-timbre and timbral incongruence. In *Outer Wilds*, the player takes control of an alien creature from a planet called Timber Hearth on the day that they join their village's small space program in order

to explore their solar system. Though the premise sounds large in scale, the solar system and the planets are extremely small, with the player character being able to circumnavigate most planets in a minute or two; even their home world has only one village with about a dozen inhabitants. Also, every 22 minutes of gameplay, the sun explodes, and the player character is sent back in time by 22 minutes. This leads to an extremely unique gameplay structure where the player explores a mini solar system in order to solve an ancient mystery left to them by a race of ancient aliens, with them progressing farther and solving more mysteries with every time loop.

Music plays essential roles in *Outer Wilds*, introducing the game's characters, solving gameplay challenges, and conveying its narrative themes. The player character's town has a space program of which they are but one member. There are several other characters that are a part of the same space program, and at the beginning of the game, the player is told they should locate them if they can. This is done through a device that can detect the direction and distance of audio signals, with all of the explorers broadcasting music. There are four other astronauts in the game, and each of them is assigned an instrument. The characters are Riebeck, who plays banjo, Chert, who plays drums, Gabbro, who plays flute, Feldspar, who plays harmonica, and Esker, who whistles. When the player pulls out the signal scanner, they can aim it until they hear any of these instruments and know which character they are pointing at, no matter where they are in the solar system. In this way, the instruments assigned to each character function as leit-timbres that signify each given character. The use of these leit-timbres also serves a gameplay purpose by informing the player which character they are scanning and allowing the player to locate them. When the player is physically close to each of these characters, they will then begin to hear the instrument they are playing, which lets them know they are close and further aids the player in locating them. In conclusion, the instruments assigned to each character function as

leit-timbres both for the purpose of introducing the characters and also for gameplay purposes typical of leitmotifs in video games. Even though the explorers are spread out across the solar system, they are all actually playing the same song in sync. This is difficult to tell since, when played separately, the parts sound very different from one another. The only way to tell that the explorers are all playing the same song together is to fly so far from the solar system that the signal scanner can detect all of them at once. An example of this can be seen in **Video Example 2.2.**

Video Example 2.2. A video of *Outer Wilds* gameplay where the distance from the solar system is so large that the signal scanner picks up all of the explorers at once.

The main melody played by the banjo serves as the main theme of the game, heard in the title menu as well as during gameplay, played by the explorer Reibeck. There is also an instance where the banjo is used to play a variation of the main theme at the end of the expansion for the game titled *Echoes of the Eye*.[27] The only time this is not the case is at the very end of the game. The purpose of the game is unclear to the player at first, as it is common to assume that stopping the explosion of the sun is the end goal. As the mystery is uncovered, the player will realize that not only has the sun simply reached the end of its life, but the universe itself is coming to an end, with the sky darkening as the stars disappear. The ending is abstract and involves the player character interacting with the other explorers around a campfire in an empty void, where one by one they all start playing their instruments. Then, the player witnesses the death of the universe

[27] The main melody is also heard from Esker who whistles it. In all of the instances of the melody being non-diegetic, the banjo alone is playing it. This places banjo as the primary instrument that plays the melody, implying that Esker is whistling along with it.

and a new big bang that is accompanied by a new rendition of the main theme we have only heard on banjo up until this point. This rendition can be heard in **Audio Example 2.11.**

Audio Example 2.11. A reprise of the main theme of the game using a synthesizer.

Although the melody has slightly transformed, the main difference is the use of a synthesizer playing the melody, which creates an instance of *leit-timbral transformation*. Since the player has heard the main theme played by the banjo multiple times through their playthrough, they begin to subconsciously associate the two with each other. When the main theme is played by the synthesizer at the end of the game, the player cannot help but think about the fact that the melody has been played by a banjo up until this point. The main timbral differences between the banjo and the synthesizer are the lack of decay in the synthesizer as well as the lack of inharmonic overtones, which give the banjo its twangy metallic sound. In terms of symbolic meaning, the use of a synthesizer specifically during the formation of a new universe could serve as a connection between the creation of new, unique sounds that are possible through the use of synthesizers. This is contrasted by the folksy, small-town connotations often associated with the banjo. In this way, the leit-timbral transformation reinforces the narrative by evoking ideas of creation.

Another instance of leit-timbral transformation occurs between a piece of music that is heard at the very beginning of the game and one that is heard at the very end of the game's credits when the player beats the game. The player character starts on Timber Hearth and plays a short tutorial before they get to fly their ship off the launch pad. The player character's town is small and features log cabins, fires where you can roast marshmallows, and an old Hearthian who sits in rocking chairs. During this time, the Timber Hearth theme plays, which features a

solo acoustic guitar at the beginning. The beginning of the Timber Hearth theme can be heard in **Audio Example 2.12.**

Audio Example 2.12. The beginning of the piece of music "Timber Hearth" is heard when the player character is in their hometown, located on the planet Timber Hearth.

The use of acoustic guitar, along with the rugged folksy aesthetic, gives off a feeling of a small but close community, of simplicity and contentedness. The very use of the acoustic guitar evokes a folk aesthetic; as explained by Andrew Bozanic, during the turn of the century, "the acoustic guitar began to embody a more organic, stripped down sound associated with folk and country music, when compared to the amplified and sometimes distorted sound of the electric guitar" (Bozanic, 2015). The guitar is also mixed very dryly with little to no reverb, so it sounds very close to the listener. This reinforces the themes of the narrative, which are the importance of human connection, of finding happiness where you are (and more importantly, who you are with), and how people can be connected even if they are far away, either by distance or by time. At the end of the credits, after you have completed the game, a short cutscene plays showing a small group of alien creatures lighting a fire that they are all gathered around. During this time, a piece called "Morning" plays, which features two cellos playing a rendition of the melody heard at the beginning of the Timber Hearth theme. The audio of this piece can be heard in **Audio Example 2.13**.

Audio Example 2.13. "Morning," which uses the same melody heard at the beginning of "Timber Hearth."

Since both pieces of music feature a single instrument, we can compare the timbres of the guitar and cello, as shown in **Table 2.3**. The key differences between the two timbres are the comparative darkness of the cello, along with the guitar having a bright and percussive attack, in contrast to the dark legato attack of the cello. This difference implies that the bright and percussive timbre of the guitar signifies the player character's hometown and all of the emotions associated with it, a simple, rugged, happy community of people who work together. This is because with the reprise of the melody played by the cello, the bright and percussive timbres are gone, just like the player character's hometown. It can also be seen to represent optimism and the spirit of adventure the player character is feeling, since the Timber Hearth theme will play when you are informed that you are about to embark on your first space launch and explore the solar system.

TIMBRES	**Guitar**	**Cello**
Sustain		
Bright/Dark	*Bright*	**Dark**
Pure/Noisy	**Noisy**	*Pure*
Full/Hollow	*Full*	*Full*
Beatless/Beating	*Beatless*	*Beatless*
Attack		
Percussive/Legato	*Percussive*	**Legato**
Bright/Dark	*Bright*	**Dark**

Table 2.3. The timbral adjectives for the guitar and cello in Timber Hearth and Morning

The same melody is played after the universe has ended and everyone the player character knows is dead, which would seem to be an instance of music incongruence. The use of the melody signifies the same sort of values associated with the Hearthians, namely community

and contentment. This serves as a way to provide a sense of comfort to the player, to show that even though there is sadness from what has ended, there will be new happiness and new communities in the future. The timbral shift from guitar to cello demonstrates that this new universe will be different, with the specific timbral attributes reinforcing the themes of the narrative. The dark attack and sustain of the cello convey that there is a sense of sadness that things have come to an end. The timbre of the cello can be analyzed from the perspective of force schema, that being how a listener conceptualizes sound through the experience of exerting force on the environment (Wallmark 2022, 64). The legato attack of the cello, contrastingly, when analyzed through force schema, creates a sense of ease, with nothing separating the notes from each other. This sense of ease makes it easier for the player to accept the end of their universe and the beginning of another.

As has been demonstrated, *Outer Wilds* has many instances of leit-timbres being used in order to reinforce the narrative. As explained earlier, each of the explorers you can meet is assigned an instrument, all of which are ones that often signify simplicity and ruggedness, such as banjo, drums, harmonica, etc. Together, they play the main theme of the game that is also heard in the main menu as well as towards the end of the game. The use of these instruments, being culturally associated with folk-town imagery, does not seem to fit into a game that is all about scientific discovery, space exploration, and the heat death of the universe. This creates an instance of *timbral incongruence*, since the player would expect timbres more associated with the sci-fi genre, such as synthesizers or a large orchestra. The use of acoustic instruments, therefore, creates incongruence and thus creates new meaning, that the themes of the game are more personal and intimate than one would expect from a space exploration game.

From a basic description of the game's concept, *Outer Wilds* would easily be assumed to be a simple space exploration game and have a soundtrack that timbrally reflects other games that fit into that genre. Two recently released space exploration video games reflect the more expected timbral attributes, *Starfield* and *Outer Worlds* (Although the titles are similar, *Outer Wilds* and *Outer Worlds* are not associated with each other).[28] *Starfield* was made in 2023 by Bethesda Game Studios, one of the largest gaming studios in the world, and actually shares several elements with *Outer Wilds*. On the surface, they are about space exploration, but *Starfield's* story involves trying to solve a mystery about how the universe works. When that mystery is solved, the player character resets the universe, allowing themselves to replay the events of the game with future knowledge. *Outer Worlds* is a lot smaller in terms of the narrative scope, but like *Outer Wilds,* it incorporates the aesthetics of Westerns in its locations. The main themes of both *Starfield* and *Outer Worlds* are entirely played by a string orchestra, which conveys a sense of grand adventure and the awe-inspiring nature of space. These two games are representative of most games that involve space exploration and sci-fi concepts.[29] A comparison of the banjo and string section timbres can be seen in **Table 2.4**. The key differences present are the brightness of the banjo in both the sustain and the attack, and the percussive timbre of the banjo when compared to the legato string section. This implies that darker legato timbres culturally signify themes of space exploration when compared to bright percussive timbres. Another key difference that is not conveyed in the table is the differences in the sustain and decay of the sound produced by the respective instruments. The sound of the banjo (as well as

[28]In fact, the use of the word "wilds" fits with the use of more "folksy" instruments since the word evokes the frontier, wilderness and log cabins.

[29] Other examples of timbres/instruments used in sci-fi media are brass which are used in *Star Wars*, *2001: A Space Odyssey* and *Star Trek: The Next Generation*. All of these examples also include string orchestras. The synthesizer timbre has also been used in sci-fi media, with the original *Star Trek* series using a theremin for the main theme.

the guitar) immediately begins to decay in volume after they are initiated. String instruments, in contrast, do not have this same decay present as a given. This is also true for brass instruments as well as synthesizers, both of which have been used often in the soundtracks of sci-fi media related to space exploration. This places the lack of decay as a key timbral signifier of space exploration. Therefore, the presence of decay in the timbres of *Outer Wilds*, as well as the cultural associations of the banjo and guitar with "low-tech" settings, creates timbral incongruence.

TIMBRES	**Banjo**	**Strings**
Sustain		
Bright/Dark	*Bright*	**Dark**
Pure/Noisy	**Noisy**	*Pure*
Full/Hollow	*Full*	*Full*
Beatless/Beating	*Beatless*	*Beatless*
Attack		
Percussive/Legato	*Percussive*	**Legato**
Bright/Dark	*Bright*	**Dark**

Table 2.4. Comparative timbral adjectives of the banjo and a string orchestra.

The incongruent combination present in *Outer Wilds* conveys the combination of high sci-fi concepts + low-tech timbres. This combination's meaning is highly specific to *Outer Wilds*

as it directly ties to its themes, but the timbral incongruity functions much like the sunset variation in Pikmin, where rather than enhancing the mood of the narrative, it instead subverts and undercuts it. The music informs the player that even though they might expect a narrative that focuses on an epic adventure, they should expect the narrative of the game to be more personal. This, in turn, primes the player to more openly accept the themes of community and human connection. Another instance of timbral incongruence that further strengthens this interpretation involves the race of ancient aliens that the player investigates throughout the game, called the "Nomai." Using a translator, the player decodes the writings of this ancient race and discovers that they were optimistic, full of humor, and extremely intelligent to the point of having built an artificial planet that can send data back in time (which is the same planet that puts the player character in the time loop). As the player reads the writings, they learn the names of specific Nomai, as well as their personalities and relationships. Even though they are long dead, the player will start to feel a connection with them, and it is by learning about them that the player learns how to reach the Eye of the Universe and create a new big bang.[30] It is easy to focus on the intelligence of the Nomai and how they exemplify the sci-fi aspects of the game's setting, but an example of timbral incongruence at the end of the game subverts this expectation and makes the player focus on the other aspects of the Nomai. After the universe has ended, the player character finds themselves in a dark forest that is implied to be the "eye of the universe," creating a location that is relatable and comforting to the character. In this forest is a small fire, around which sit all of the explorers. One by one, you can speak to them and ask them to play, eventually resulting in all of them playing the main theme of the game together. If you complete a specific side-quest in the game, another character other than the explorers will appear at the

[30] Although never specifically stated, it is implied that if no conscious being reaches the Eye of the Universe then a new universe will not be created. This would result in the true and final end of existence.

fire, that being a Nomai named Solanum. When asked to join in the song, their instrument is discovered to be a piano. The piano shares with the banjo the trait of having a decay in its volume, and with the Nomai being so technologically advanced, one would expect timbres more associated with the sci-fi genre to signify them. This instance of timbral incongruence makes the player focus not on the intelligence or inventiveness of the Nomai but on the emotional connection the player has formed with them through their writings. This reinforces the themes of connection, showing how not even distance or time can prevent it.

Through the use of leit-timbre, the game *Outer Wilds* helps the player navigate the game by having timbres signify specific characters in the game. The leit-timbres are also used to reinforce the narrative themes of community, connection, and accepting one's place in the universe through leit-timbral transformations. The use of timbral incongruence primes the player to shift their expectations away from a more typical space exploration story and be more ready to engage with the narrative themes of the game. It is my hope that this analysis demonstrates the application and effectiveness of both leit-timbre and timbral incongruence in the analysis of a soundtrack.

Chapter 3: Leit-timbres and Timbral Incongruence in *Hyper Light Drifter* (2016)

The main-menu theme of the 2016 video game *Hyper Light Drifter* sets up a clear opposition of timbres that is indicative of the rest of the soundtrack. As heard in **Audio Example 3.1**, this theme features three instruments: a synth, a drum, and a shaker.[31] **Table 3.1** charts these sounds using the timbral binaries described in the previous chapter. The synth's timbre is very bright, making it sit at the top of the track as it plays the melody. This is in contrast to the drum as well as the shaker, which are both very dark, sounding as if they are coming from a different room. One of the most striking differences is in the presence of noise. The drum and shaker are both very noisy, almost sounding like there is an included distortion or tape saturation giving them an industrial quality. There also seems to be a slight amount of bit-crushing, which is the practice of lowering the bit-rate of a sound in order to add harsh noise and compression. The result of bit-crushing is noise that sounds glitchy; **Audio Example 3.2** shows an example I made of bit-crushing on a drum machine. All throughout the music, there is noise fading in and out that sounds choppy, glitching in and out, which can be heard towards the beginning of Audio Example 3.1. This glitchy noise is created by a noise generator on a synth being run through a bit-crusher, which the composer Richard Vreeland described as creating "Ocean wave sounds" (Music Workshop - FEZ). This means that the only sound without noise is the synth, which is

[31] The drum and shaker sound like they were generated from a drum-machine and so are technically synthesizer timbres as well. I will be referring to synthetic percussion timbres in accordance to what instrument they are imitating (what they are functioning as an icon for) in order to make the analysis clearer.

pure. The contrast of dark and bright, as well as noisy and pure, is established as soon as the player boots up the game.

TIMBRES	**Drums**	**Shaker**	**Synth**
Sustain			
Bright/Dark	**Dark**	**Dark**	*Bright*
Pure/Noisy	**Noisy**	**Noisy**	*Pure*
Full/Hollow	*Full*	*Full*	*Full*
Beatless/Beating	*Beatless*	*Beatless*	**Beating**
Attack			
Percussive/Legato	*Percussive*	*Percussive*	**Legato**
Bright/Dark	**Dark**	**Dark**	*Bright*

Table 3.1. Comparative timbral adjectives of instruments present in the "main menu theme".

Audio Example 3.1. "Menu Theme" heard at the title menu for the game *Hyper Light Drifter* (2016).

Audio Example 3.2. A drum groove heard at 16 bits, 10 bits, 8 bits, and 6 bits.

Given the narrative themes of purity, cleansing, and sickness, the contrasting timbres set up by the main theme reinforce these themes before the player has even started the game. Noise arises from non-harmonic frequencies and is often conceptualized through the use of textural metaphors, such as "grainy" or "rough" (CITATION—Wallmark?). Noise can also signify decay, specifically in relation to how music recorded on tape and vinyl will eventually become noisier over time due to the material literally decaying. Both tape and vinyl distortion have come to be used to signify decay in general. A famous example of this is the 2016 piece *Everywhere at the End of Time* by The Caretaker, which features classic jazz tunes that have been run through a vinyl distortion effect that progressively gets stronger until all that is left is the noise of the distortion. It is important to note that the vinyl distortion is present at the very beginning of the

piece. *Everywhere at the End of Time* was specifically made to represent dementia and uses noise in order to represent the advancement of the disease. The presence of noise at the beginning of the piece shows that the effect narrative being told starts with the protagonist already succumbing to dementia.

Darkness is often associated with evil and negativity, from a low growl of a wild animal to distant thunder. This connection was discussed by Charles Forceville and Thijs Renckens, who, in more blunt terms, state that "Light and darkness can be used metaphorically to help structure good and bad" (2013). Together, darkness and noise function as a sign for the disease that is present in the game as well as the source of that disease. The synth's pure timbre places it in immediate opposition to dirt and decay evoked by the noisy drums. The adjective for the timbre alone implies that it signifies something that is free of sickness. The timbral adjectives alone carry with them certain connotations, and throughout the soundtrack of *Hyper Light Drifter,* certain timbres show up together and come to function as leit-timbres. There are also instances in the game where timbral aspects are seemingly out of place, which creates instances of timbral incongruence.

The Development of *Hyper Light Drifter*

Hyper Light Drifter is an action-adventure video game released in 2016 and developed by the development studio Heart Machine. It is famous for its pixel-art-inspired visuals, its enigmatic storytelling, and, most of all, for its soundtrack, which is made almost entirely with synthesizers. *Hyper Light Drifter* was originally the passion project of game developer Alx Preston, who created a Kickstarter for the project in 2013 (Preston 2013). After far exceeding the initially set

funding goal, he decided to found Heart Machine to hire employees to help with the project. **Video Example 3.1** shows an example of gameplay.

Video Example 3.1. A video of gameplay from *Hyper Light Drifter* (2016). The area seen is the "Midnight Wood," and combat against generic enemies can be seen.

One of the most notable aspects of *Hyper Light Drifter* is the soundtrack, which was composed by Richard Vreeland, a.k.a. Disasterpeace. According to Vreeland, he amassed "about 100 piano ideas" that the lead designer, Alx, would then go through and decide which ones would be used and in which location they would work best (Vreeland 2016). Vreeland would then expand on these musical ideas in the digital audio workstation Logic by working them into a larger form and designing the synth patches for the different parts. Richard has said that during the sound design process, "there was definitely an attention to creating a lot of ambiguous sounds falling somewhere on a scale between organic and robotic" (2016a).

The conflict between organic and robotic is reflected in the timbres present in the soundtrack, resulting in several leit-timbres that all signify narrative and thematic elements. The main timbral conflicts that contribute to leit-timbres are bright vs. dark as well as pure vs. noisy. These two conflicts reflect the conflict taking place in the game's narrative of health vs. sickness as well as technology vs. nature. In order to fully understand the leit-timbres, it is first necessary to understand not just the story of *Hyper Light Drifter*, but also the motivations of the lead creative director, Alx Preston.

A Story of Death and Acceptance

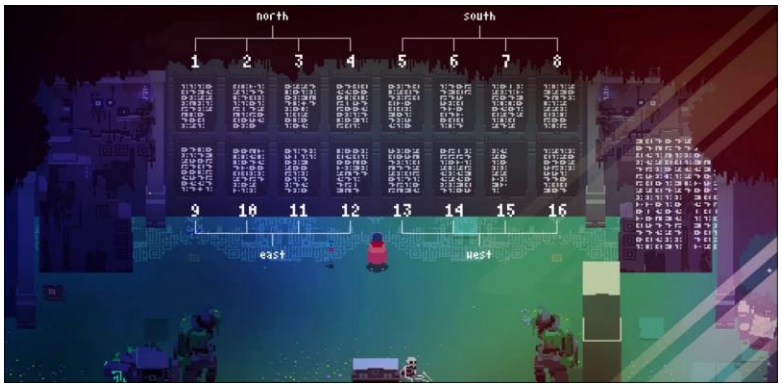
The storytelling of *Hyper Light Drifter* is vague, with no spoken or written dialogue appearing in the game. The visuals alone convey the narrative to the player, who must use contextual clues to infer what is happening in the story. The game begins with a cutscene that gives background information on the world and sets up the goal of the player character, seen in **Video Example 3.2**. The cutscene establishes that a cataclysmic explosion has occurred, destroying the largest city on the game's main island. The player-character, referred to as "The Drifter," is then shown to be sick and coughing up blood as a dark monster appears behind them, implying that this monster is the source of a sickness. A jackal-like creature appears to the player character, which seems to be a personification of death or perhaps even a god of death. This jackal gives the player-character a vision of that same dark monster surrounding a crystal made of light, which The Drifter reaches for as they are consumed by darkness. Although there is a lack of context, the premise is simple. The Drifter is dying from a disease that stems from a dark monster, and so the player must attempt to reach this monster to slay it and potentially cure the disease by navigating a post-apocalyptic world.

Video Example 3.2. The intro cinematic of the video game *Hyper Light Drifter* (2016), featuring the piece titled "Vignette: Visions"

Throughout the game, the player can find monoliths that have an alien script written on them, seen in **Example 3.1**. Through the efforts of the community, this script was decoded and can actually be translated into English.[32] The translations from the monoliths reveal that they

[32] After the in-game language was decoded by the community, Heart Machine released a collectors edition of *Hyper Light Drifter* that came with a decoding ring that confirmed that the community was correct in their decryption.

were created by a character only referred to as “The Librarian.” The name of the island on which the game takes place is revealed to be “The Land of Light,” and The Librarian states that they are trying to preserve the lost history of this land. The city destroyed in the intro cutscene was the capital of The Land of Light, founded by the disparate cultures on the island who wanted to work together in order to advance their technology. Eventually, the only thing left to conquer by this advanced civilization was death itself, depicted in their murals as the jackal seen in the intro cutscene and throughout the game. They created what is referred to as a “perfect immortal cell,” which they would “imbue” into themselves to avoid death. The creation of the immortal cell inadvertently led to the creation of the dark monster that haunts The Drifter and whose name is revealed to be “Judgement.” Judgement is the being that destroyed the capital city and unleashed large robotic titans to ravage the land, but was ultimately defeated and locked away in a vault. At the end of the translations, it is revealed that preserving history was not the only motivation of The Librarian. The writings reveal that they, too, were afflicted with the disease that The Drifter has, and that although Judgement is locked away, they are able to infect the inhabitants of The Land of Light with this disease. At the final discoverable monolith, the player will find the skeleton of The Librarian, who eventually died from the disease.



Example 3.1. An image from the game *Hyper Light Drifter* showing monoliths in the game that are covered in the fictional in-universe language.

Throughout the game, the player will find a character referred to as "The Guardian," who will help the player character as well as the other inhabitants of The Land of Light. It is revealed that The Guardian is also afflicted with the disease and is attempting to slay Judgement, and with each encounter, The Guardian will cough more and more. Through dialogue that is depicted entirely through images, The Guardian tells the player they have also been seeing visions of the jackal as well as Judgement. In the final area of the game, the player will discover the body of The Guardian who succumbed to the disease, and on their body, the player will find the final key that allows them to open the vault containing Judgement. The player then finally enters the vault that contains Judgement, where the final battle commences. When defeated, the immortal cell that powers Judgement is revealed and is stabbed by The Drifter, destroying it. Up until this point, there is nothing that contradicts the idea that the disease will dissipate once Judgement is defeated, but as the vault collapses and the jackal appears to lead the player out, The Drifter begins coughing blood and stumbling more than ever. After escaping the vault, The Drifter lies against a stone statue, and the game ends with a final cutscene that shows Judgement's influence over The Land of Light dissipating. The Drifter is shown clutching their chest and falling to the ground, and the camera pans upwards to show clear blue skies. The ending cutscene can be seen in **Video Example 3.3**.

Video Example 3.3. The ending cutscene that plays after completing *Hyper Light Drifter* (2016), showing The Drifter stabbing the immortal cell before being led out of the vault by

The Jackal. The light over the city dissipating, as well as the sky turning blue, both show that the immortal cell is destroyed and is no longer influencing The World of Light.

The story of the game is bleak, with it being revealed only at the end of the game that The Drifter was doomed to die no matter what. The ending isn't depicted as strictly sad, but rather melancholic and hopeful, with the final shot being clear blue skies for the first time in the game, showing that although not successful in saving themself, The Drifter did prevent everyone in The Land of Light from suffering the same fate. The game's story has some autobiographic elements for the game's creator. Throughout the promotional material for *Hyper Light Drifter*, Preston has been open about the fact that he was born with a congenital heart defect that, according to his doctors, could at any time kill him without warning. He talks at length about this in a video released by Vice (2016). He was told there is nothing that can be done about it and has had to come to terms with his death at a very young age. He has directly stated that his medical condition influenced the narrative and themes of *Hyper Light Drifter*. The advanced civilization in the game wanted to conquer death at all costs, and in their efforts to do so, inadvertently created even more death and destruction. The Drifter, just like Preston himself, is afflicted with a disease that has no cure and will eventually lead to his death. The theme of *Hyper Light Drifter* is not about conquering death, but about accepting death and doing what you can with the time you have. During the events of the game, The Drifter kills monsters and warlords who were taking advantage of the destruction to wreak further death and violence. They also encounter a variety of citizens of The Land of Light that they send to a safe haven, and most of all, they destroy the immortal cell, which prevents the disease from spreading further. It is not clear whether The Drifter knew if killing Judgement or not would cure them, but taking into account the themes of the narrative as well as the words of the creator Alx, that is not the point. The point

is that The Drifter did not give in to despair and, in their final days, did what they could to help people.

The main themes of *Hyper Light Drifter*'s narrative are death and decay, the conflict of technology vs. nature, and accepting that everything must eventually come to an end.[33] All of these thematic elements were presented to the composer Richard Vreeland as he and Preston worked closely together throughout the development process: "Alex brought me on to score the game right before we announced the Kickstarter" (2016a). Vreeland represents the narrative sonically through sound design and, as a result, uses both leit-timbre and timbral incongruence to reinforce the themes.

The Sonic World of The Land of Light

Vreeland, in his blog, states that "there's a kind of conflicted quality to a lot of the game" (2016a). Vreeland decided to represent this conflict sonically by creating sounds that exist on a spectrum between robotic and organic, often blending the two. This spectrum represents the game's narrative themes as well as the aesthetics of the game world, which features technological wonders that have been corroded and covered in overgrown flora. The game's soundtrack features a specific technique in its sound design that takes advantage of the synthesizer's capabilities, that being modulation. Vreeland mentions this in his blog, stating that

[33] Interestingly enough, even though they are completely different in terms of aesthetic and gameplay, both *Outer Wilds* and *Hyper Light Drifter* share a lot of narrative themes. The main difference is that *Outer Wilds* does not have the concept of flying too close to the sun that is present in *Hyper Light Drifter*. In the *Outer Wilds* expansion titled *Echoes of the Eye,* it is revealed that there is ship in the solar system hidden by a cloaking device where an alien species named Owlks continue to live on in a simulated world as their bodies decay. They are also using their technology to hide the eye and prevent the formation of a new universe because they fear death so much. In this way, *Outer Wilds* also portrays the concept of being so fearful of death that technology is used to subvert it.

when it came to the synth patches, he wanted to "try and give them movement and make them feel alive" (2016a). This can be heard in the very beginning of the game during the intro cinematic, with the first and second chords of the piece titled "Vignette: Visions" featuring a synth patch that resembles a flute and is fluctuating in pitch and volume. This can be heard in Video Example 3.1 from 0:00 to 0:11.

Due to how often this technique is used in the soundtrack, I will introduce a new timbral adjective pair: steady/modulating. Practitioners generally use the word "modulation" to refer to controlling different timbral parameters through the use of patch cables (Ried 1999). For the purposes of this thesis, I use the term to refer to timbral changes that occur during a synth note's sustain. These can involve a) change in a manner that is constantly repeated without the onset of a new note, often done through the use of a low-frequency oscillator; or b) change in a way that is not possible with an envelope, such as a synth chord that has a bright attack that goes into a dark sustain that then gets brighter. This second method either requires physically manipulating the synth's settings or automating its parameters. These can both be heard in **Audio Examples 3.3** and **3.4**.

Audio Example 3.3. The note C3 is being played on a virtual synth called Surge. The lowpass filter is being modulated by an LFO.

Audio Example 3.4. A Cm7 chord being played on Surge. An envelope causes the bright attack to decay into a dark sustain, which then becomes brighter through the automation.

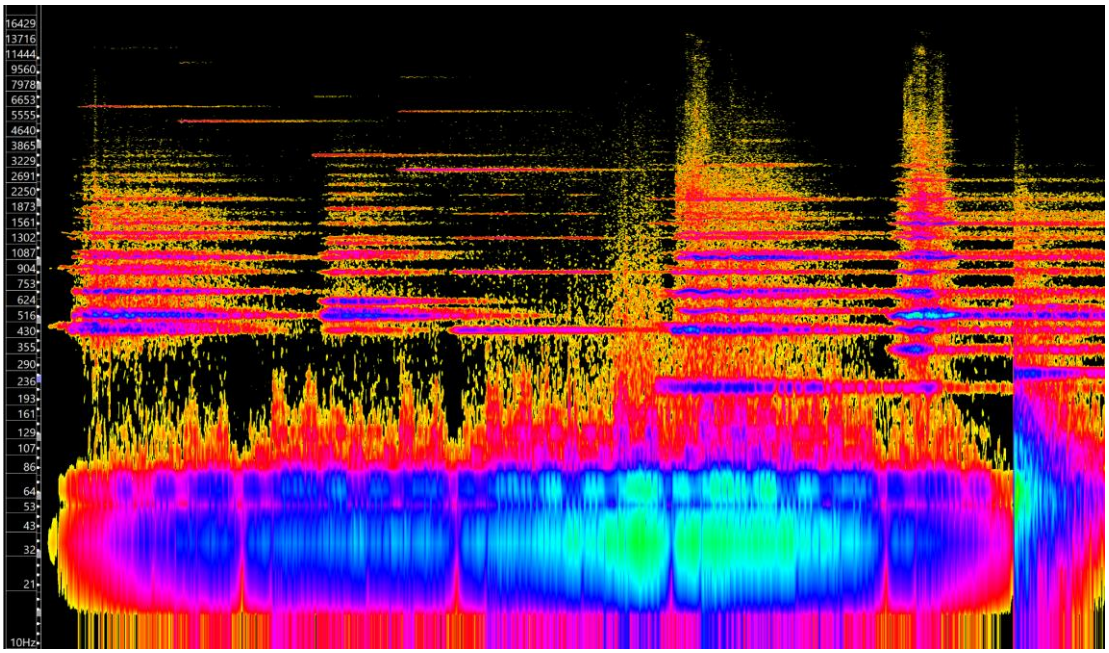
"Vignette: Visions" features a wide variety of synth patches that often only appear once. From the beginning of the intro cinematic up until 27 seconds in, heard in video example 4 from 0:00 to 0:27, there are four synth patches present. I label each synth sound according to what

acoustic sound it most closely resembles. This will mean that the synth patches will be labeled according to how they function as icons.[34] The flute-like synth mentioned previously is present during this portion of the piece, along with what can only be described as a high-pitched ringing synth. At around eleven seconds in, what sounds like a muted trumpet enters, and at fifteen seconds in, what sounds like a men's choir is heard. A spectrogram of the first 27 seconds can be seen in **Example 3.2.** The cluster of frequencies in the center is the flute synth, with the large frequency at the bottom being a low rumbling noise that is present throughout the beginning of the piece. The ringing synth is hard to notice on the spectrogram and has been pointed out in **Example 3.3.** The trumpet synth comes in right after the second chord played by the flute synth, seen in **Example 3.4**. The choir synth comes in on the third chord, seen in **Example 3.5**.

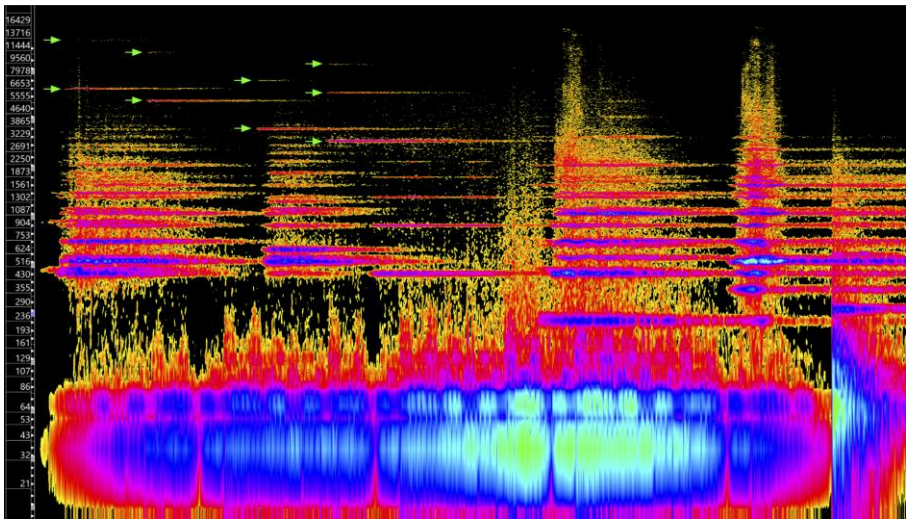
Using my ear as well as the information gained from the spectrogram analysis, I have labelled the timbral adjectives of these synth patches as seen in **Table 3.1**. All of the instruments present are legato and have full timbres. The prevalent use of legato, when viewed through force schema, brings to mind ease of passage and a lack of barriers (Wallmark 2022). The flute appears very wide in the spectrogram, indicating that there is a large amount of noise. It is bright with its overtones reaching up to just below the ringing synth. The ringing is bright, with even its base frequency well above the other instruments' overtones. It is also pure, with it appearing in the spectrogram as a thin line. The trumpet's brightness changes over time, seen in the spectrogram, with its overtones increasing and decreasing in volume. Due to being unable to separate the timbres in the spectrogram in order to calculate their respective spectral centroids, I labeled the trumpet's timbre as dark, relying on my ear. The choir is darker than every other

[34] Labeling the synth patches this way is purely for making the tables easier to understand for the reader. References to their iconic function will mostly be discarded during the analysis unless it is relevant.

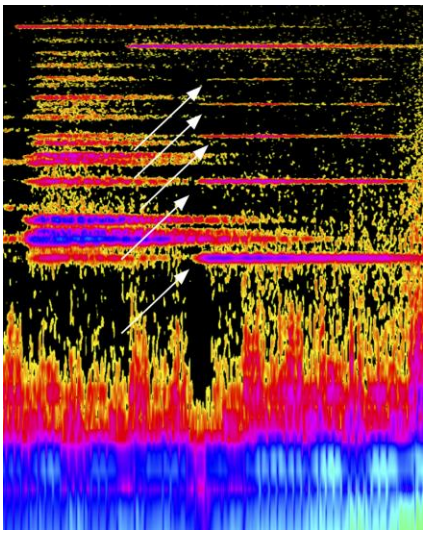
instrument present and is also noisy, having a thick line in the spectrogram. Both the flute and the trumpet have modulation on them, with the ringing and choir being steady.



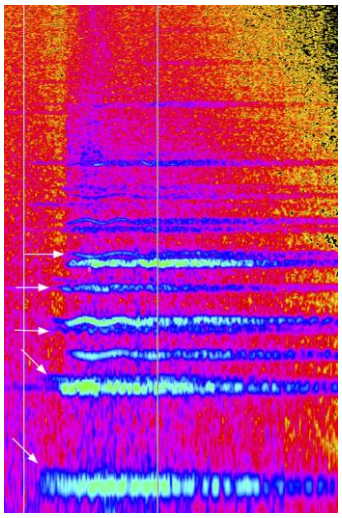
Example 3.2. A spectrogram of the first 27 seconds of the piece “Vignette: Visions”.



Example 3.3. The same spectrogram as in Example 3.1, with green arrows pointing towards the frequencies of the ringing synth.



Example 3.4. The same spectrogram as in Example 3.1, with the frequencies of the trumpet synth pointed out with white arrows.



Example 3.5. A zoom-in on the third chord with the choir synth frequencies pointed out with white arrows.

TIMBRES	Flute	Ringing	Trumpet	Choir
Sustain				
Bright/Dark	*Bright*	*Bright*	***Dark***	***Dark***
Pure/Noisy	**Noisy**	*Pure*	*Pure*	**Noisy**
Full/Hollow	*Full*	*Full*	*Full*	*Full*
Beatless/Beating	***Beating***	*Beatless*	*Beatless*	**Beating**
Steady/Modulating	***Modulating***	*Steady*	***Modulating***	*Steady*
Attack				
Percussive/Legato	***Legato***	***Legato***	**Legato**	**Legato**
Bright/Dark	*Bright*	*Bright*	***Dark***	***Dark***

Table 3.1. Comparative timbral adjectives for synth patches present in the first 27 seconds of "Vignette: Visions"

Two things that all of the synth patches present have in common are that they are all full as well as legato.[35] Otherwise, the timbral adjectives do not have any clear pattern. After close examination, I noticed that all of the timbral adjectives appear in pairs of two. Both the trumpet and choir are dark, while the flute and ringing are bright; the flute and choir are noisy, while the ringing and trumpet are pure. This pattern repeats for every timbral adjective. This follows along with Richard stating that he wished to establish a duality in the timbres (Vreeland 2016a). The flute and ringing are bright while the trumpet and choir are dark; the ringing and trumpet are pure while the flute and choir are noisy, etc. This timbral duality would make it difficult to assign markedness to any of the synth patches since every timbral adjective appears in equal amounts (Lavengood 2020). This sets up an opposition where timbral adjectives are represented in equal numbers, representing the opposing forces found in the game's narrative, such as technology vs. nature and life vs. death. The timbral adjectives showing up in relatively equal

[35] Them all having a full timbre is most likely due to Vreeland using a sawtooth wave for all of them, which is the only soundwave on a subtractive synthesizer that has all of the overtones present.

frequency shows that these opposing forces are in balance, or at least should be as shown before the explosion happens.

Both the flute and the ringing synth are bright, with the two differentiated by the presence of noise and modulation in the flute. Video Example 3.2 shows a scene at 0:27 where a mural depicts a denizen from each region of The Land of Light surrounding The Jackal. The denizens hold pillars, which light up one at a time, accompanied by the ringing synth. The ringing this time is beating rather than beatless, achieved through detuning duplicate oscillators that are playing the same note.[36] This change in timbre functions as a leit-timbral transformation, signifying the disparate regions coming together to accomplish a greater goal since the timbre became beating through the addition of multiple oscillators working in tandem. This also shows that the ringing, and as a result, brightness and purity, are all associated with the technological wonders created by their cooperation, since it comes in when the pillars light up. These pillars are representations of the pillars found in each area of the game, which act as generators that power the technology found in the respective region. These generators are what allowed the previous civilization to become so advanced and create the immortal cell. After the four pillars in the mural are lit up, the jackal in the center lights up as well, accompanied by the flute synth. The jackal lighting up when the flute enters shows that the flute signifies the jackal that, in turn, represents death. This interpretation is confirmed throughout the game, where the appearance of the jackal is coupled with the flute, as seen in **Video Example 3.4**.

Video Example 3.4. A recording of gameplay from *Hyper Light Drifter*. The player enters a new zone, and The Jackal appears, accompanied by the flute synth from the game's intro.

[36] This reading is an aural analysis based on my experience.

Since both the ringing and the flute are bright, this would imply that the presence of noise is what indicates death. Brightness, then, seems to function as an indicator of positivity or morality. This connects to the concept of bright timbres being used to establish a framework for what is "good" in stories (Forceville and Renckens 2013). The denizens and the jackal, being morally good, are reinforced throughout the gameplay. All of the in-game information indicates that the denizens of The Land of Light had a high moral standard and that their attempts to avoid death were due more to fear than to any evil intentions. After all, the in-game text states that the "perfect immortal cell was crafted to be imbued within all sentient life, a noble goal." The jackal is a personification of death, appearing to characters that have been infected with Judgement's disease. It is not necessarily portrayed as a malicious character, being the one who tells The Drifter of the immortal cell and guides him in his quest at several points throughout the game.

The darkness present in the trumpet and the choir serves as a way to create an ominous feeling, signaling the coming danger. The trumpet comes at 0:09 of Video Example 3.2 as the camera pans down, and the choir enters when the lights floating over the city are revealed to the viewer. These lights represent Judgement's influence, shown at the end of the game when they dissipate after the immortal cell is destroyed. The choir's noise represents death, while its darkness hints that the lights present are more ominous than it appears. The trumpet, however, is pure, which has previously been associated with technology. This signifies that the immortal cell and Judgement are both a result of the denizens of the Land of Light flying too close to the sun and attempting to use their technology to defy death and, as a result, the natural order.

Each timbre has a general association established in the intro: brightness represents moral goodness and technology, noise represents death, and purity represents things uncorrupted by Judgement. Although not leit-timbres themselves, the individual timbral adjectives used in the

soundtrack of *Hyper Light Drifter* signify different elements of the narrative themes. These timbral adjectives are combined in certain ways throughout the game that, as a result, combine their associations and come to function as leit-timbres.

The Technology Leit-timbre

As shown in the previous section, bright timbres are used to signify advanced technology in *Hyper Light Drifter*'s soundtrack. Throughout the game, the player will explore the ruins of the previous civilization and will encounter remnants of their technology. The four encounters with technology I will focus on are: 1) the monoliths that contain writings from The Librarian; 2) the hyper-light totems found in the "Divine Path"; 3) the invisible floating platforms used to access secret areas; and 4) the power-generating pillars that the player must activate to complete the game. While the hyper light totems are just a part of the scenery and constantly emanate sound, the other three objects are interactive and play a sound effect when interacted with. These sound effects can be heard in **Audio Examples 3.5–3.8**. Although the sounds connected to these objects are all slightly different, they all share timbral traits: brightness and noisiness. From the intro cinematic, it has been established that bright timbres signify technology through the use of the ringing synth, but the ringing was pure, while the sound effects heard in these examples all contain noise. This is most striking with the sound effect that plays when the pillars are activated, since in the intro cinematic, the pure ringing synth plays when the pillars are lit up, but when activated by the player, noise is present. I argue that this is an example of leit-timbral transformation that conveys the passage of time.

In the case of the intro cinematic, the player is shown a vision of the past before and during the cataclysm that destroyed the city. In this case, the purity of the ringing synth used in

conjunction with the pillars being lit is conveying to the player that at this time, the technology was new and uncorrupted by Judgement. As stated earlier, decay in sound can be used to signify physical and technological decay, more importantly, in relation to technology such as vinyl records and magnetic tape. The player is never informed of exactly how much time has passed since the cataclysm, but the visuals hint that it has been quite a while, with vegetation and overgrowth taking over most of the structures seen in the game. This passing of time is even shown with the pillars having become covered in moss, which **Example 3.6** shows. The addition of noise to the brightness, which signifies technology, is therefore an example of leit-timbral transformation that is used in order to inform the player that this technology has not been used in a long time.



Example 3.6. A screenshot from Hyper Light Drifter depicting The Drifter (seen to the left) standing near the pillar located in “The Eastern Watershelf”

Audio Example 3.5. A recording from Hyper Light Drifter showing the sound effect heard when a monolith is activated

Audio Example 3.6. A recording from Hyper Light Drifter showing the sound effect heard when standing near the hyper light totems located in “The Divine Path”

Audio Example 3.7. A recording from Hyper Light Drifter showing the sound effect heard when the invisible floating platforms located throughout the game are activated

Audio Example 3.8. A recording from Hyper Light Drifter showing the sound effect heard when the pillars located in each region of the game are activated

Timbral Corruption

In the intro cinematic, from 0:37 to 0:53 of Video Example 3.2, two new instruments are introduced: a rough bass synth and a brass synth. Both of these new instruments have very noisy timbres, with both of them having a large amount of bit-crushing and tape saturation. Both the brass and the rough bass are modulated, with the rough bass becoming more and more distorted and noisy, and the brass becoming brighter during their respective sustains. These instruments appear as the intro shows that the lights and sky have turned purple, and as they modulate, tension increases until the city explodes. The modulation builds up to the explosion, but the presence of modulation also signifies a change since modulation literally is change over time. With the rough bass, this represents the accidental creation of Judgement that permanently changed the World of Light. The bass is associated with the corruption of the immortal cell that turns the people's technology against them. This also explains why the brass that is noisy and leads up to the explosion is bright, even though it does not signify moral goodness. The moral goodness and technology of the denizens turned against them and led to their own destruction. In this case, bright, noisy, and modulated timbres represent this corruption of technology that leads to death and destruction. In both of these cases, the presence of modulation is the key timbral attribute that represents the corruption of otherwise benign or good things. This functions similarly to the type of musical corruption outlined by Blaire Ziegenhagel, which she describes

as “a familiar soundscape (being) corrupted by prototypically horrific musical conventions” (Ziegenhagel 2026). In this case, rather than small changes in pitch being used, the timbral adjective of modulation is used to corrupt other timbral attributes and signify the influence of Judgement.

Timbral adjectives have their own associations, but they are often combined in *Hyper Light Drifter*’s soundtrack in order to create new associations that often function as leit-timbres. This is similar to how topics, well-known musical allusions, are combined together in order to form tropes, as explained by Robert Hatten (2025). This combination of timbres comes to function as a leit-timbre that represents Judgement. Judgement’s first appearance is in Video Example 3.2 at 1:27, where a bright, noisy, modulating synth timbre is heard. Right before then, the rough bass synth appears and leads up to the alarm. This would imply that dark, noisy, modulating timbres signify that Judgement is close, even though they cannot be seen, and bright, noisy, modulating timbres signal the actual appearance of Judgement. I will call these the *influence leit-timbre* and *Judgement leit-timbre,* respectively. **Example 3.7** shows a table of both leit-timbres and their timbral attributes.

Influence leit-timbre	Judgement Leit-timbre
Dark	Bright
Noisy	Noisy
Modulating	Modulation

Example 3.7. A graph showing the timbral attributes of the Judgement leit-timbre and the influence leit-timbre.

The influence leit-timbre is used at the beginning of the game’s intro cinematic with the dark, noisy modulating synth sound underscoring the beginning. Example 2 shows this sound at

the bottom of the spectrogram as a large, changing bar. **Video Example 3.5** demonstrates the use of the influence leit-timbre. The hub area of the game, a safe haven in the city that survivors are holed up in, contains the vault holding Judgement. When the player stands on the vault, the standard hub area music fades away and is replaced by a dark, noisy, modulating synth timbre (at 0:14 in the video example). This is an example of the influence leit-timbre, demonstrating that the player is close to where Judgement is locked away, and even though they cannot be seen, they are still a detriment to the world. The timbre being dark also serves to demonstrate that Judgement is literally located below the player, locked away underground, with its disease leaking out.

Video Example 3.5. A recording of gameplay from Hyper Light Drifter. The player walks around the vault, where the standard hub area music titled "Seed of the Crown" is heard. When the player moves onto the vault that contains Judgement, the music fades and is replaced with a dark rumbly synth sound.

Video Example 3.6 demonstrates the use of the Judgment leit-timbre. This is the first appearance of Judgement during gameplay, and the music heard is the same bright, noisy modulating synth timbre that was heard in relation to Judgement in the game's intro cinematic. Judgement appears to The Drifter throughout the game and is always accompanied by the Judgement leit-timbre. This specific combination of timbres represents the fact that although Judgement arose from the intention to do good (bright), it eventually was corrupted (modulating) and brought about death and disease (noise).

Video Example 3.6. A recording of gameplay from Hyper Light Drifter. The player is walking upwards before the controls become unsteady as The Drifter starts coughing. Eventually, The Drifter collapses, and the player fully loses control as Judgement appears and slowly approaches The Drifter.

Both the influence leit-timbre and Judgement leit-timbre come together in the track titled "Chimera," which plays while fighting the final boss, Judgement. **Audio Example 3.9** demonstrates an excerpt of this piece of music. While originally referring to a mythological creature from ancient Greece, the term chimera is also used for creatures that are created from distinct combined DNA, which is fitting since Judgement is a result of technology being used to meddle with death. "Chimera" is mostly composed of a loud, distorted bass that is accompanied by a harsh soundscape. The bass present functions as the influence leit-timbre since it is dark, noisy, and modulating. Every now and then, a bright, noisy, modulating synth timbre cuts through the soundscape. This synth timbre is the same one that accompanies Judgement's appearances throughout the game, functioning as the Judgement leit-timbre. The use of both of these leit-timbres in "Chimera" clearly demonstrates that they signify aspects of Judgement while also clarifying what those specific aspects are.

Audio Example 3.9. A small portion of "Chimera" from the game *Hyper Light Drifter*. This track serves as the music for the final boss fight against Judgement.

The influence leit-timbre is named as such since throughout the game it appears while Judgement is unseen, but his presence is felt, and the Judgement leit-timbre is used when the player can see Judgement. However, the times that the player has seen Judgement throughout the game are actually visions and hallucinations witnessed by The Drifter, a symptom of his

condition. This would imply that the Judgement leit-timbre is not necessarily signifying their physical presence, but is actually signifying the disease that Judgement is spreading. The influence leit-timbre signifying Judgement's presence underground and also being the main timbre heard during the boss fight implies that it does not just signify Judgement's influence, but actually signifies their physical location and presence. "Chimera," therefore, alters the player's perspective of the leit-timbres at play by revealing that dark, noisy, modulating timbres are the Judgement leit-timbre that represents both Judgement, their influence, and their corruption. This means that the Judgement leit-timbre and influence leit-timbre have swapped what they signify in the player's mind. Retroactively, dark, noisy, modulating timbres are understood to be the Judgement leit-timbre, and bright-noisy, modulating timbres are understood to be the influence leit-timbre, which **Example 3.8** shows.



Judgement Leit-timbre	Influence Leit-timbre
Dark	Bright
Noisy	Noisy
Modulating	Modulation

Example 3.8. The table seen in Example 3.7 showing the timbral adjectives associated with the Judgement leit-timbre and influence leit-timbre have switched.

Judgement and The Last General

The Judgement leit-timbre is mostly used in order to signify the literal presence of Judgement. There is one notable instance where the judgement leit-timbre is used in a way that is, on the surface, completely unrelated to Judgement. This is in the track titled "The Last General", which

plays when fighting the boss of the same name. **Audio Example 3.10** demonstrates the timbres present in this track. The instrument that is of note is the bass, which features all of the timbral traits of the Judgement leitmotif. This could be interpreted as merely a use of dark, noisy bass in order to indicate danger and increase the perceived energy of the fight, indicating that this is a boss and it will be more challenging than fighting standard enemies. The presence of modulation in the bass, however, is what makes this an instance of the Judgement leit-timbre, and it is the modulation that sets this boss battle apart from the rest. **Audio Example 3.11** demonstrates a collage of all of the other boss themes heard throughout the game. For all of the other boss battle themes, the bass is also both dark and noisy, signifying danger, death, and evil, but none of their basses are modulating. This places "The Last General" as the only boss battle theme in the game besides "Chimera" to feature the Judgement leit-timbre. This would imply that the character called The Last General is somehow connected to Judgment or is at least under their influence, while the other bosses are not, which is a reading reinforced by the narrative of the game.

Audio Example 3.10. "The Last General" from the game *Hyper Light Drifter*. This track plays when fighting the boss of the same name.

Audio Example 3.11. A collage of three boss battle themes from *Hyper Light Drifter*, named "Cult of the Zealous," "The Hermit," and "The Sentients" respectively.

The objective of the game is to activate four pillars that are located in the four regions of The Land of Light. Each pillar requires you to defeat a boss in battle in order to activate it, but the bosses are not shown to be associated with the pillars or Judgement; they are merely obstacles that are obstructing your path. In the game's narrative, the bosses you fight are shown to be either outsiders or those in power who took advantage of the devastation brought about by

Judgement in order to take control of the region. The first boss is found in the northern region, called the Divine Path. The mountains of the north were the home of an intelligent bird race that practiced spirituality. It is shown that one of these birds led a cult that took over the mountains after the cataclysm, called The Hierophant. The second boss is found in the eastern region called the Eastern Watershelf. The otter-like creatures of the Eastern Watershelf were invaded by a race of frogmen after the cataclysm, and now control the area and enslave the otters, led by a giant frog called The Emperor. The third boss is found in the southern region called the Wastes. This area is the most mysterious, containing large underground facilities and almost no information on who built them. The boss fought in this region is called The Archer, and they are implied to be some sort of hunter who kills the monsters that roam the land, mistaking The Drifter for one of them. There is no apparent connection between these bosses and Judgement, and the timbres used in their themes reinforce this.

To the west of the city's ruins, there lies the region called The Midnight Wood. This region is the home to the tanuki and is covered in crystals called "hard light crystals." Unlike the other regions that fell to coups or invasions, the Tanuki and their leader, The Last General, still control their home. The hard light crystals have been shown to be able to be made into weapons, with even the sword wielded by The Drifter being made of them. This same crystal is also seen to be growing out of the tanuki and The Last General, who all attack The Drifter on sight. **Example 3.9** shows an image of The Last General, while **Example 3.10** shows the tanuki warrior encountered in The Midnight Wood. The monoliths found in the Midnight Wood reveal that The Last General and his people have been corrupted and driven insane by the hard crystal. The monoliths also reveal that The Last General is centuries old and was the leader of the tanuki as far back as the cataclysm. Since he was alive and leading the Midnight Wood during the time

of the cataclysm, it must be the case that he was directly involved with the creation of the immortal cell, either by commissioning it or directly helping in its creation. The use of the Judgement leit-timbre in his boss theme implies that there is a connection between Judgement and The Last General, which reinforces this narrative.



Example 3.9. A screenshot from the game Hyper Light Drifter depicting the boss called The Last General. Hard light crystal can be seen growing from his shoulders.



Example 3.10. A screenshot from the game *Hyper Light Drifter* depicting a "Tanuki Warrior". Hard Light Crystal can be seen growing from their shoulder as well as from their back, seen behind the handle of their sword.

Another possible interpretation is that the use of the Judgement leit-timbre implies that Judgement is currently influencing The Last General. Most of the weapons in the game are made of hard light crystal, like The Drifter's sword and The Guardian's sword. Even the guards that

stand at the city ruins carry spears with hard light crystal tips, shown in **Example 3.11**. Nowhere else in the game is it the case that the use of hard light crystal weaponry can backfire and cause the same corruption seen with the tanuki and The Last General. The reason the crystal has started corrupting the denizens of The Midnight Wood is never clearly explained, but the use of the Judgement leit-timbre in "The Last General" may give the answer. The Judgement leit-timbre signifies the physical presence of judgement as well as their influence, and so Judgement may have been influencing the hard light crystal ever since they were locked away. It is shown that Judgement can still influence the world above by spreading disease, and it may be the fact that the hard light crystal has been fashioned by Judgement into a sort of infection that corrupts the Midnight Wood denizens, driving them mad. "The Last General's" use of the judgement leit-timbre recontextualizes the narrative and shows that the weakened mental state of The Last General and his warriors is not just a result of the hard light crystals, but is the result of Judgement's influence.



Example 3.11. A screenshot from the game *Hyper Light Drifter*. The Drifter stands on the right, and a town guard is seen to the left holding a hard light crystal spear.

Accepting Death

In much the same way *Hyper Light Drifter* utilizes leit-timbres often, the game also uses incongruence both subtly throughout and explicitly during the end credits. *Hyper Light Drifter'*s soundtrack can mostly be divided into three categories: 1) set piece stingers, 2) boss music, and 3) exploration music. Set piece stingers occur at several points in the game in tandem with a set piece. This includes instances when The Drifter has visions of Judgement, when the player comes across a landmark, and when the player sees the jackal. While there are five main bosses in the game, all of which have their own theme song, there are a variety of mini-bosses that usually use the same music. If the player is not coming across a set piece or fighting a boss, they will hear exploration music. Each area of the game has its own theme that plays while the player is exploring, and all of these themes can be described as very peaceful. **Audio Example 3.12** shows a snippet of "Cascades", the music heard when exploring the Eastern Watershelf area. Most of the timbres heard are legato, with even the bell-like synth coming in towards the end having a slightly slowed attack.[37] The instruments present lean more towards brightness and do not have much in terms of modulation. There is also a lot of white noise present that comes in with the instruments and is also in the background, getting louder and quieter. Running water has been found to generate white noise, and so the increasing and decreasing volume of white noise in "Cascades" mimics the natural sounds of water (Qian, Li, and Chen 2024). The Eastern Watershelf features a city built on the water, and so this use of noise serves to further immerse the player into the game's setting. White noise has been proven to cause relaxation, and its presence in "Cascades" serves to create a relaxing, calming effect on the listener (Zeng 2025).

[37] When a synth has a fast attack (ranging from 0-10 ms), there is an audible click heard. Since the bell-like synth does not have this click, this means that Vreeland deliberately turned up the attack in the ADSR envelope.

The other area themes are similar in effect, which makes sense since the music heard while exploring should generally be low energy so as not to become grating to the player. What is unusual is that, unlike other games that include combat music where the exploration music can fade in when encountering enemies, *Hyper Light Drifter* does not have any combat music other than during the limited number of boss fights. When encountering enemies in each area, the calm, ambient music just continues. This is an instance of incongruence since the relaxing music continues on during stressful fights, and since the relaxing nature of the music primarily comes from the timbre, the area themes all create instances of timbral incongruence.

Audio Example 3.12. A clip from the audio track "Cascades" from *Hyper Light Drifter* (2016).

The timbral incongruence present in the area themes of *Hyper Light Drifter* functions mainly as a way to recalibrate what the player is focusing on narratively. The world, which was once thriving, is now devastated, and death is all around The Drifter. Everywhere the player goes, they see decaying buildings, the skeletons of the old denizens, and even the bodies of those killed more recently. Rather than have combat music that creates excitement when fighting enemies, the music stays muted and contemplative. This, in turn, causes the player to feel what The Drifter is feeling. There is no reason to think The Drifter relishes killing; they simply want to find a way to live. The timbral incongruence between the music and the combat puts the player in the mindset of the protagonist, having them embody the role of the tragic hero.

A major instance of timbral incongruence occurs at the end of the game during the final cutscene, seen at 0:58 of Video Example 3.3. As the ground shakes and The Drifter lies dying, the track titled "Panacea" is heard. While almost every piece of music used in *Hyper Light*

Drifter started as a piano sketch that was then arranged for synth, "Panacea" remains the only piece of music in the game that uses piano. A version of "Panacea" was also used in the reveal trailer of *Hyper Light Drifter*, and Vreeland stated in his blog that the reason it was chosen for the trailer is that "using music that seems unfitting has worked quite well in past game trailers" (2016a). It is implied that the reason "Panacea" does not fit is because it is a relaxing piano piece, while the game has a sci-fi aesthetic and the rest of the soundtrack uses synthesizers, making this an instance of timbral incongruence. The scene shows the lights disappearing over the city, the Drifter collapsing, and finally a clear blue sky. This creates a change in the amount of incongruence over time, with the peaceful piano music being incongruent with the Drifter's death but congruent with the clear blue sky. The meaning behind this instance of timbral incongruence lies in the meaning of its name. Panacea refers to a remedy that can cure any ailment, which is fitting given that The Drifter's goal is to find a way to cure their disease. The Drifter is shown to die at the end of the game, so why is the music played during his death named after something that should prevent his death? The reason goes back to one of the main themes of *Hyper Light Drifter*, that being accepting death as a natural part of life. The timbral incongruence highlights that after freeing the world from Judgement's influence, the Drifter has sat down and accepted that their time has come but all is right with the world they leave behind.

Chapter 4: Leit-timbres and Timbral Incongruence in *It Follows* (2014)

Video Example 4.1 shows a scene from the 2014 horror movie *It Follows*. During this scene, the track titled "Jay" can be heard, which shares its name with the main character. Jay can be seen getting dressed, and given that in the previous scene she told her friend she had a date, the viewer can assume she is getting ready for it. The music at first is very soft and soothing, with lots of bright legato timbres heard. At around 0:18, Jay gets up and walks towards a vanity mirror in her room. As she reaches it, a new timbre is heard that is far from the relaxing ones heard previously. A dark, rumbling synth can be heard right as she reaches for a bottle of pills, and a minor iv chord is heard. Since this is just a scene of a girl getting ready for a date, there is not any apparent threat or danger shown. Even though the viewer may be aware that this is a horror film, at this point, the monster or how it works has not been revealed, and so, on the surface, this scene should not evoke any fear. This creates an instance of incongruence, which causes the viewer to feel unease about what this date will lead to. The timbre is the most salient feature creating this sense of unease, and so this is also an instance of timbral incongruence.

Video Example 4.1. A scene from the horror movie *It Follows* (2014). The main character, Jay, is seen getting ready for a date while the track titled "Jay" is heard.

The melody is the most present in the mix, being the brightest. Underneath the melody, there is a subtle harmonic filler that is a bit darker. Although it sounds like one synth patch is playing both the melody and the chords, there are different wave types present in both, with the

melody being a square wave and the harmonic filler being made of sawtooth waves.[38] The harmonic filler uses sawtooth waves, and it is audibly apparent that there is detuning present. Both the melody and the pad are relatively bright while also being pure and without modulation. As **Table 4.1** shows, the bass contrasts with the melody and harmonic filler by being dark and noisy. Darkness in all media has often been associated with the concept of evil which, as mentioned in the previous chapter, was studied by Forceville and Renckens (2013). This association of darkness with evil is starkly presented to the viewer of *It Follows* since the darkness of the bass is highlighted by the other two synth patches being so comparatively bright. The noise present in the bass also serves as a way to create a feeling of tension, supported by a study done by Morwaread Farbood and Khen Price that found that noise results in an increase in tension felt by the listener (2017).[39] The bass combines the associations of both darkness and noise together in order to elicit the feeling of fear and tension within the viewer, further highlighted by the bright purity of the other synth patches[40] as well as the timbral incongruence that occurs between the visuals and the music.

TIMBRES	**Pad**	**Melody**	**Bass**
Sustain			
Bright/Dark	*Bright*	*Bright*	**Dark**
Pure/Noisy	*Pure*	*Pure*	**Noisy**
Full/Hollow	*Full*	**Hollow**	**Hollow**
Beatless/Beating	**Beating**	*Beatless*	*Beatless*
Steady/Modulating	*Steady*	*Steady*	*Steady*

[38] This assessment is entirely based on my listening, though with my experience and expertise I am certain that I am correct in the different soundwaves present.
[39] Farbood and Price's study also found there was not a clear correlation between brightness vs. darkness and an increase in tension. Both bright and dark timbres were found to be able to elicit and increase in tension in the participants.
[40] The timbral attributes of the bass being highlighted in this way is similar to timbral markedness as discussed by Megan Lavengood (2020).

Attack			
Percussive/Legato	**Legato**	**Legato**	**Legato**
Bright/Dark	*Bright*	*Bright*	**Dark**

Table 4.1. Comparative table showing the synth patches present in "Jay" as well as their timbral attributes.

"It" Follows

It Follows is a supernatural horror movie directed by David Robert Mitchell and released in 2014. The story follows the main character, Jay, a college-age girl who is haunted by a mysterious entity only referred to as "It" that follows her after a sexual encounter. For the rest of the movie, Jay teams up with her friends in order to find ways to avoid "It" and attempt to find a way to end the curse. One of the most notable aspects of the film is the soundtrack, which was entirely made using synthesizers. The soundtrack for *It Follows* was written and recorded by Richard Vreeland, who also composed the soundtrack for *Hyper Light Drifter*. Mitchell stated in an interview with Ben Jones that he discovered Vreeland through his work on the soundtrack for the video game *Fez* (2012), and he also said, "I hadn't put the film together in any serious way, I was just beginning to. I got in touch with Rich (Vreeland), who is Disasterpeace, and told him I'm trying to do a horror film and I'd love for him to do it. I sent him the script for *It Follows,* and he agreed" (2015).

Vreeland, in his blog, states that the process of scoring *It Follows* was very collaborative between him and Mitchell, and that a major part of the process was deciding on the timbral identity of the film: "We had some creative disagreements at times, but that's a routine part of collaborating. I wanted the sounds to be warmer and rounder in certain spots. He sometimes

yearned for brighter, more digital tones" (2016b). This shows that timbre was an important focus of the composition process for the soundtrack. With timbre being such a focus during the composition process, both leit-timbres as well as timbral incongruence are employed throughout the film in order to reinforce the narrative.

The Chase and Proximity Synths

The first scene of *It Follows* simultaneously sets up two different leit-timbres while also creating an instance of timbral incongruence. **Video Example 4.2** shows a snippet from the first scene, showing a distressed young woman running from something that neither the viewer nor the other characters present can see. The track titled "Heels" can be heard during this scene, featuring a dark, noisy synth sound that repeatedly plays. I call this the *danger timbre*. Darkness, as explained earlier, is used to signify evil or danger (Forceville and Renckins 2013). Noise has also been found to lead to an increase in tension when heard, likely due to the act of embodiment as the listener imagines the tension involved in creating noise (Farbood and Price 2017). Both of these timbral attributes present in the danger timbre, in the context of this scene, serve to signal danger to the viewer even though that danger cannot be seen. This is an example of timbral incongruence that creates a feeling of danger even though there isn't one visually present. It can be argued that since the unnamed girl is distressed, the use of ominous music does not serve as incongruence since there is an audio-visual connection. However, I would argue that the viewer being unable to see any type of threat to the girl creates incongruence, although. This, in combination with the use of leit-timbres, will later be shown to signal the distance between the monster and the victim. Since the viewer cannot see the monster at this point, they have no way of knowing how close the monster is to the girl and, therefore, how much danger she is in. It can

be argued that since the unnamed girl is distressed, the use of ominous music does not serve as incongruence since there is an audio-visual connection. However, I would argue that the viewer being unable to see any type of threat to the girl creates incongruence, although one that is not as strong as those from previously shown examples. At the beginning of the scene, the girl is distressed, and the music is ominous, placing it closer towards congruence, but as the scene continues and the as-of-now unknown leit-timbres are heard, the amount of incongruence increases. This is because the viewer cannot see the monster at this point, meaning they have no way of knowing how close the monster is to the girl and, therefore, how much danger she is in.[41] This plays on humans' fear of what they do not know, with neurologist Nicholas Carleton stating "fear of the unknown may be a, or possibly the, fundamental fear, representing an Archimedean lever for human psychology" (2016).

Video Example 4.2. A portion of the first scene in *It Follows* (2014). In it, an unnamed young woman is seen running in fear and then backing away while looking at an unseen entity.

Video Example 4.3 shows the next part of the scene when the woman starts running in a wide arc back towards her house. When she starts running, a timbre is introduced that is both faster rhythmically as well as containing more noise. This timbre, while still relatively dark, is slightly brighter than the lower rumbling heard before. I call this the *chase synth*. After reaching her house, **Video Example 4.4** shows her running out of the house towards her car. As she runs

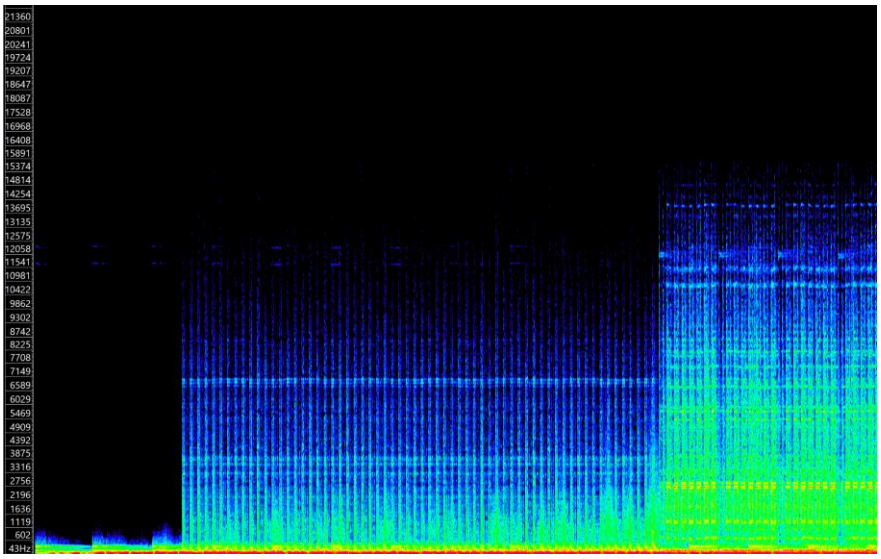
[41] Since the film places the viewer in a situation where they aren't visually shown the danger, one could argue that this makes the ominous music function in terms of *creation*. However, with the presence of leit-timbres that haven't been established in the viewers mind yet, I argue that it sits firmly in incongruence. This is especially the case since there is still information being visually presented to the viewer.

out of the house, she glances towards where she was in Video Example 4.2, and a new timbre that has much higher frequencies than the other timbres heard in the scene. This timbre is also much noisier compared to the rumbling and chase timbres heard earlier in the music. I call this the *proximity timbre*. **Audio Example 4.1** contains a snippet of the track "Heels" where the three timbres can be heard entering into the mix, and **Example 4.1** shows a spectrogram of this snippet. Both of these examples demonstrate a clear arc that is being established by the timbre, that of increased noise and brightness. The danger timbre, when compared to the chasing and proximity timbre, is very dark and not actually that noisy in comparison. Both the chasing and proximity timbre are extremely noisy, as is shown by the inharmonic frequency content present when they show up in the spectrogram. The proximity timbre is clearly both the brightest and noisiest timbre, creating a linear increase in both brightness and noisiness in "Heels."

Video Example 4.3. Later on in the first scene of *It Follows* (2014). The young woman, after backing away slowly, begins to run around the invisible entity towards her house.

Video Example 4.4. After Video Example 4.3, the unnamed woman runs back into her house. This example shows her running back out her house and towards her car.

Audio Example 4.1. A snippet of the track "Heels" from the horror movie *It Follows* (2014). The three primary timbres heard in the track are heard entering one after another.



Example 4.1. A spectrogram showing the frequency content present in Audio Example 4.1. The beginning shows the dark frequencies of the danger timbre. The increase of brightness and noise in the middle shows the chase timbre. The highest peak in both brightness and noise towards the end shows the proximity timbre.

The increase in brightness serves as a way to increase the feeling of danger and tension in the viewer, signaling to them that whatever unseen danger is present is getting closer. The proximity of the timbre's brightness causes it to serve semiotically as an icon, specifically imitating the sound of an alarm. Although studies have found that brightness does not necessarily cause tension in listeners (Farbood and Price 2017), bright timbres are much more audible to the human ear, and bright noisy timbres are often used in different types of alarms (Bruck, Ball, Thomas, and Rouillard 2009).[42] The increase of noise, as shown by Farbood and Price (2017), serves to create a feeling of rising tension in the viewer as they embody the timbre. The increase

[42] This study found that while bright, high pitched timbres are more audible to humans when awake, darker lower pitched timbres are more audible to humans when asleep. This can be seen as the timbres present in "Heels" showing that even though the audience cannot see what the woman is running from, the danger is not in her imagination. This fits a narrative throughline in the movie where the main character Jay has to prove to her friends that the monster is real even though they doubt its existence and assume that she is suffering from PTSD.

in noise throughout “Heels” also creates an increasing feeling of “corporealness” (Leydon 2012) through the textural metaphor of noise. Rebecca Leydon states that “When inharmonic noise crosses the tolerance threshold set by our perceptualizing impulses, a sound becomes incorrigibly fleshy, entangled in the sheer materiality of matter” and that noise falls within the high end of “corporeal presence” (2012, 6). When noise is present in recorded sound, that sound will be considered much more tangible and “real” to a listener. The increasing of noise as the different timbres are presented in “Heels” increases the feeling of realness and proximity to the unseen danger presented in the film, hence my use of the terms chasing timbre and proximity timbre. There is also the use of meter introduced in the chase and proximity timbre that contribute to the rising sense of tension, although later on these same timbres appear without the meter, showing that it is not considered a necessary aspect of the leit-timbres that will be established.

Leit-timbres as Distance

During the opening scene of *It Follows*, the viewer would be unaware of the existence of the monster or the fact that it is invisible to those not affected by the curse. Because of this, both the chase and proximity timbres suggest danger without the viewer being aware of what the danger is. It is not until later in the film that they become leit-timbres, recontextualizing the viewer’s understanding of the opening scene. Towards the beginning of *It Follows*, the main character, Jay, goes on a date with a man with whom she has sex. Afterwards, she is drugged and wakes up tied to a wheelchair. The man then explains that he has a curse where an entity that can take on any form, even those of people she knows, will slowly follow her without ever stopping. He explains that this entity will kill her if it reaches her and that the only way to get rid of the curse is to pass it on to someone else by sleeping with them. He does this all in a remote location, and

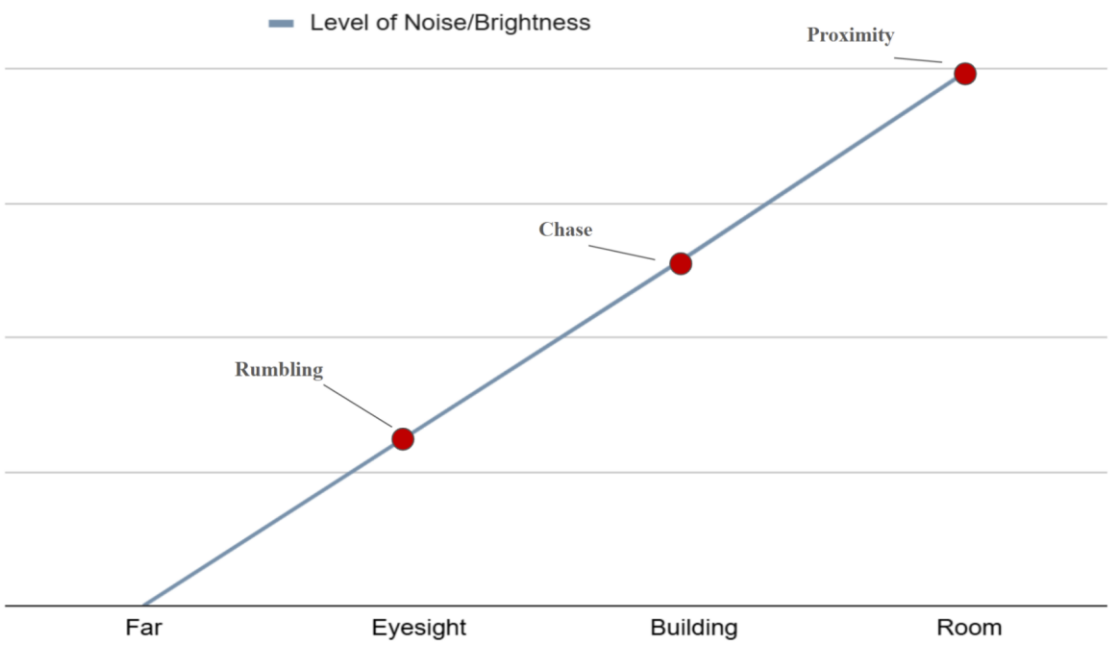
afterwards, he drives her home and throws her out of his car. Days pass, and Jay is not sure if the whole situation actually happened, and begins to doubt if the curse is real. Then, while in a class, Jay has her first real encounter with the entity when she spots an old woman staring and walking towards her from a distance. The track titled "Old Maid" is heard, and **Video Example 4.5** shows a snippet of this scene.

Video Example 4.5. A scene towards the middle of *It Follows* (2014). Jay is sitting in a college English class and sees an old woman staring at her and walking towards her from outside. She leaves the class in fear, and in the hallway, the old woman continues to follow her. The track "Old Maid" is heard.

Much like in the track "Heels" heard towards the beginning of the movie, noise is heavily used in the timbres present during this scene. The noise present in "Old Maid" is similarly used to signify danger and the tension felt by Jay as she runs from this mysterious entity. In fact, when comparing the tracks "Heels" and "Old Maid", one will notice that the same timbres are heard. The danger timbre can be heard from 0:05 to 0:09 of Audio Example 4.1. This associates the danger timbre with the fact that the entity is nearby enough to pose a danger. At 0:20 of Video Example 4.5, the chase timbre is heard playing the same rhythm heard in "Heels." At 0:34 of Video Example 4.5, while Jay is walking in the hallway, the proximity timbre is heard—quietly at first when the woman rounds the corner but remains unseen by Jay. The proximity timbre then becomes louder as both Jay and the camera stare at the woman. The entity being so close when the proximity timbre enters implies that they must have been in the building by the time the chase timbre starts playing, showing that the chase timbre is associated with the entity being closer than when the danger timbre is heard but further away than when the proximity timbre is

heard. This clearly demonstrates that each of these timbres signifies a certain amount of distance between the entity and the cursed character, which **Example 4.2** shows.

These leit-timbres, through their use in both the opening scene and Jay's old woman encounter, become associated with the physical distance between the entity and its victim. This, in turn, recontextualizes the viewer's perspective on the opening scene, seen in Video Examples 4.2–4.4. While the entity cannot be seen from the viewer's perspective, the timbral associations allow them to understand how far the entity is from the young woman and, therefore, how much danger they are in. In Video Example 4.2, the danger timbre is heard, and so the viewer understands that the entity is within eyesight and that the unnamed woman is keeping her distance while leading the entity away from her house. In Video Example 4.3, the chase timbre is heard, which shows the audience that the entity has gotten close enough to her that she needs to run to get away and return to her house. In Video Example 4.4, the proximity timbre is heard, which, in tandem with her panicked glance, shows that while running towards her car, she runs right by the entity that has gotten dangerously close. Due to these timbres repeatedly and consistently signifying the relative distance between the entity and the point of view character, they all function as leit-timbre. As one could guess from their assigned names, I call these the danger leit-timbre, chase leit-timbre, and proximity leit-timbre.



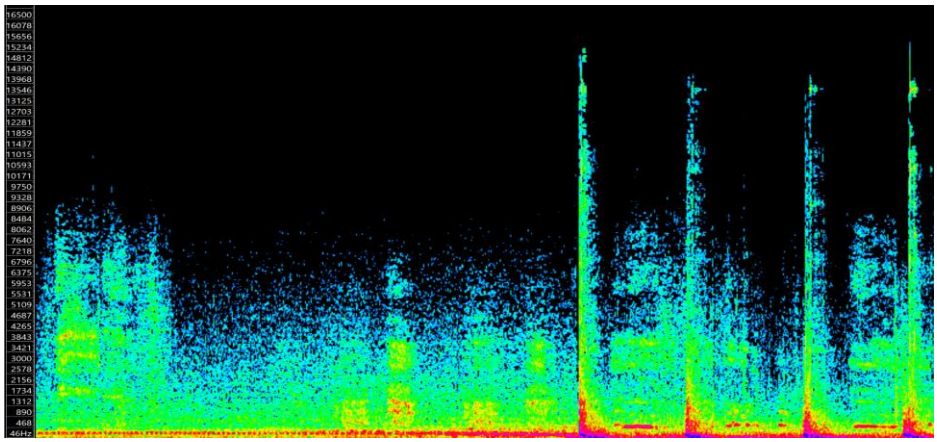
Example 4.2. A chart showing the correlation between the amount of noise/brightness in a timbre and the relative proximity between the entity and the cursed character. For eyesight, building, and room, the correlating timbres are rumbling, chase, and proximity.

It Follows includes several encounters with the entity, and most of them utilize these leit-timbres in order to reinforce the sense of danger the characters are experiencing. Later on in the movie, Jay's friends do not fully believe that the entity is real, but take her to hide out on a remote beach in order to make her feel better. The entity eventually reaches the beach and attacks them, causing them all to panic and hide in a shed. **Video Example 4.6** shows a snippet of this scene where the entity attempts to break down the door. At the start of the snippet, there is ambient noise, but right as the door starts shaking, a dark rumbling timbre comes in. **Example 4.3** contains a spectrogram of the audio from Video Example 4.6, showing that the rumbling timbre heard is not only darker but is visually much thicker than the ambient noise heard before,

meaning it contains more noise.[43] This is an example of the danger leit-timbre, showing that the entity is close enough to pose a threat to Jay. After the entity breaks through the door, it seems to disappear, and Jay starts calling for one of her friends who was left outside. **Video Example 4.7** shows a later part of the scene as she calls out through the broken door, only for the entity to reappear as a small child that crawls through the hole. Throughout Video Example 4.7, there is a noise that increases in volume and a noise that is brighter than the dark rumbling timbre heard before. This is an example of the chase leit-timbre, showing that the distance between Jay and the entity is getting dangerously close. At the end of Video Example 4.7, when the child appears, extremely bright and noisy timbres are introduced into the score. **Example 4.4** shows a spectrogram of Video Example 4.7. This not only serves as a way to increase the tension through the introduction of noise (Farbood and Price 2017), but also demonstrates the usage of the proximity leit-timbre that reinforces the sense of danger from the entity being so close to Jay. In this scene, there is not as much of a stark difference between the danger and chase leit-timbre as seen previously. I argue that this is for the purpose of tricking the audience and increasing the surprise felt at the appearance of the entity. Making it unclear how close the entity truly is before the sudden appearance of the boy and the arrival of the proximity leit-timbre further heightens the surprise felt by the viewer.

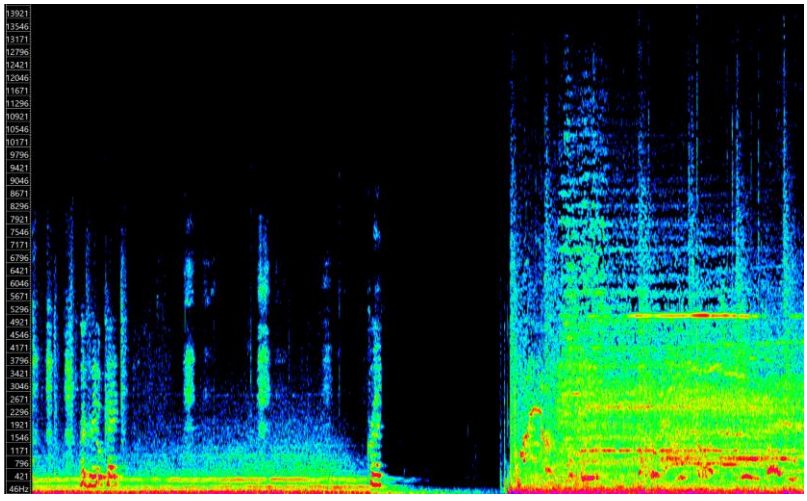
Video Example 4.6. A snippet of a scene from It Follows (2014). Jay and her friends are hiding in a shed while the entity attempts to break down the door.

[43] Timbres that contain a large amount of inharmonic frequency content appear thick when viewed in a spectrogram.



Example 4.3. A spectrogram showing the frequency content present in the audio of Video Example 4.6. The rumbling timbre becomes darker and noisier when the slams are shown (the peaks). The presence of noise shown between the peaks is the noise made by the characters.

Video Example 4.7. A snippet later on from the same scene as in Video Example 4.6. Jay calls out to her friend through a hole in the door made by the entity. The entity then appears as a small boy and crawls through the hole towards Jay.



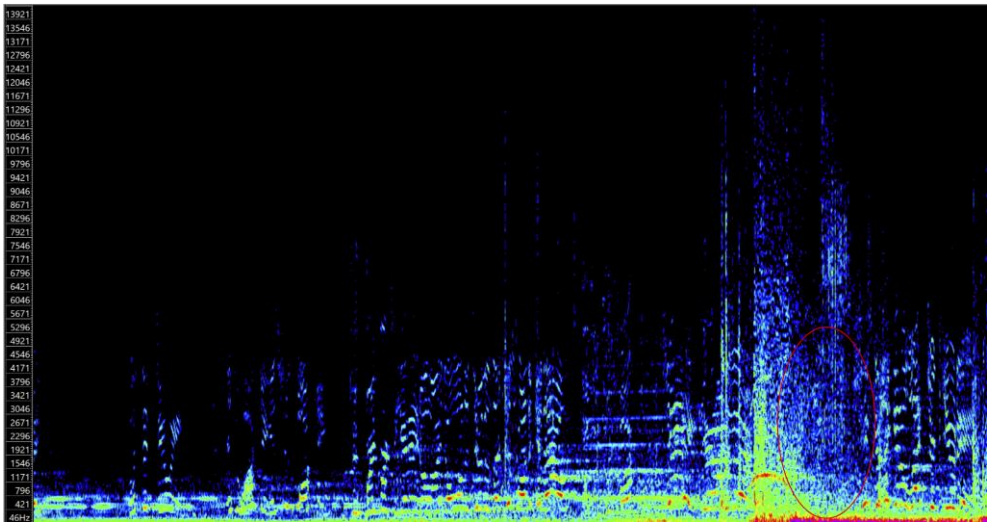
Example 4.4. A spectrogram showing the frequency content present in the audio of Video Example 4.7. The chase leit-timbre is shown at the beginning, while the proximity leit-timbre can be seen towards the end.

Video Example 4.8 shows an edited clip from the final scene of It Follows, where Jay and her friends attempt to lure the entity into a pool in order to kill it. They plan to have the entity chase Jay into the pool, where they will then have her get out before throwing electronics into the pool in order to electrocute the entity. During the beginning of Video Example 4.8, a dark, noisy sound is heard as we see a shot from the entity's point of view as it walks through the building; the sound continues as the shot changes to show Jay and her friends waiting at the pool. This dark, noisy timbre incorporates the danger leit-timbre, showing that the entity is approaching. At 0:11 of Video Example 4.8, Jay states that the entity has entered the room. At this point, the viewer might expect the chase timbre to enter the score to signify that the entity is closing in. Instead, the danger leit-timbre continues to be the only timbre present in the score. This begins to make sense at 0:21 when Jay says that rather than the entity approaching her, it stands still at the edge of the pool staring at her. Since the entity is not attempting to reach her in the pool, the chase timbre does not play.

Video Example 4.8. An edited video showing the final encounter scene from *It Follows* (2014). The entity walks through the building while Jay and her friends wait at the pool with electronics lining the edge. After the entity enters the room, Jay describes what it is doing to her friends before the entity starts throwing the electronics into the pool to electrocute Jay.

The danger leit-timbre continues to be the only timbre present in the score until 0:31, where a bright timbre with a large amount of noise is heard as one of the electronics lining the pool is lifted and thrown at Jay while she is in the pool. **Example 4.4** shows a spectrogram of the end of Video Example 4.8, showing that before this bright timbre enters, there is less inharmonic frequency content and that, besides the characters' voices, it is the brightest timbre present in the score at this point. This is an example of the chase leit-timbre, though instead of signifying the

literal proximity of the entity, in this case, it signifies the danger posed by the entity, in this case, the proximity of the electronic device thrown at Jay. Since the entity does not enter the pool to literally chase Jay and the thrown device is dodged, the chase leit-timbre is merely hinted at here as it goes away very quickly.

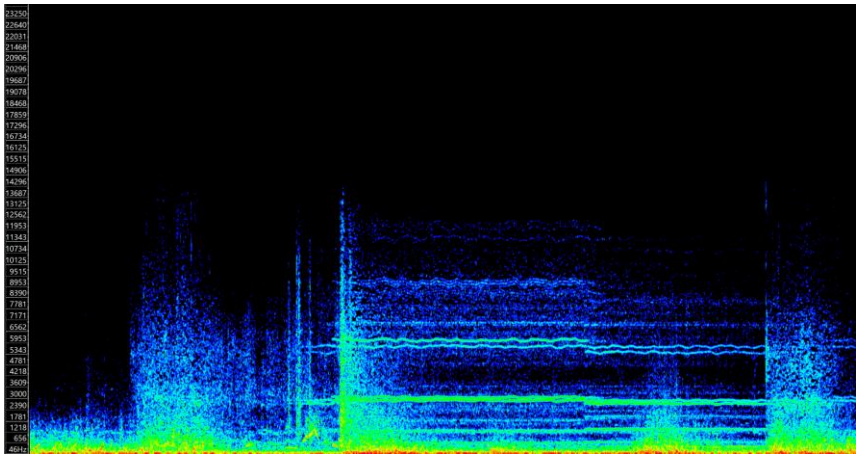


Example 4.5. A spectrogram showing the frequency content towards the end of Video Example 4.8. The red circle to the left shows an area where the chase leit-timbre is present with no yelling or loud splashes. The red circle to the right shows where the chase leit-timbre is present, shown as the solid green lines surrounded by inharmonic frequencies.

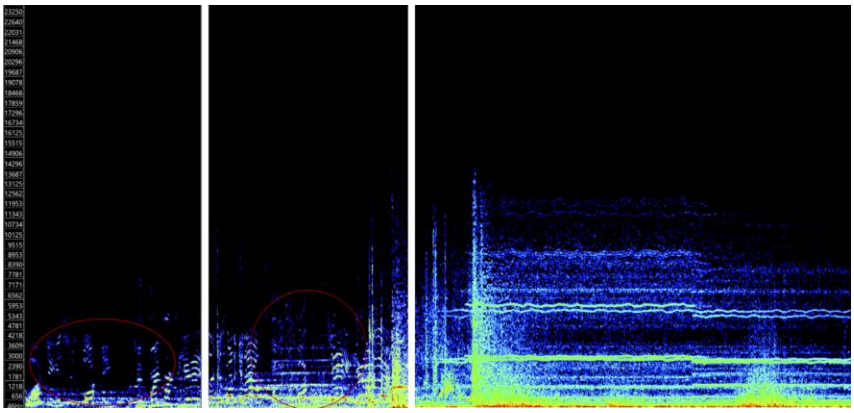
The entity continues to throw objects at Jay from the edge of the pool, with Jay dodging or blocking all of them. **Video Example 4.9** shows a clip later in the scene where the entity throws a chair at Jay, which is the first object that connects, causing her to bleed. When the chair hits her, a bright, noisy timbre is heard, shown in the spectrogram in **Example 4.5**. After the initial splash of the chair hitting the water, which causes a lot of noise, you can see the brighter timbre enter, along with a large amount of noise. This is the proximity leit-timbre, but in this case, it does not signify that the entity is dangerously close. It is heard when the first thrown object strikes her, signifying the harm done to her by the entity's throws becoming more

accurate. The idea of the proximity leit-timbre signifying the entity's throws becoming more accurate is reinforced by the way the proximity leit-timbre slowly fades away, a feature that was not present in the other instances of the proximity leit-timbre being used. This fading away shows that the damage done by the entity is short-lasting and that the entity still is not able to reach Jay in the pool. **Example 4.6** shows the frequency content of the danger, chase, and proximity leit-timbres as they appear in Video Examples 4.8 and 4.9, demonstrating the increase of brightness as well as noise as the danger to Jay increases.

Video Example 4.9. A clip showing a later part of the final encounter scene. After emerging for air, Jay sees the entity throw a folding chair, which strikes her in the head, causing her to bleed.



Example 4.6. A spectrogram showing the frequency content present in Video Example 4.9. The bright timbre can be seen in the center of the spectrogram as the solid green lines surrounded by noise.



Example 4.7. Spectrograms showing the danger leit-timbre (on the left), chase leit-timbre (in the middle), and proximity leit-timbre (on the right).

Later in the scene, one of Jay's friends shoots the entity in the head, causing it to fall into the pool. Video Example 4.10 shows Jay trying to get out of the pool after the entity has fallen in, only for it to grab her foot and drag her underwater. As Jay is dragged into the water, a timbre that is brighter and noisier than the previously heard timbres enters the score. This is an example of the proximity leit-timbre, and unlike the previous examples of the proximity leit-timbre in this scene, this instance of the leit-timbre goes on for a long time. This is used to signify that the danger posed by the entity is much greater since they are now physically close to Jay, as opposed to before, when the entity was only able to throw objects at her.

Since the soundtrack of *It Follows* is largely non-pitched, timbre takes center stage when it comes to conveying musical meaning. This is demonstrated by the repeated use of the danger, chase, and proximity leit-timbre in order to signify the entity's presence as well as cause the viewer to feel the same fear and tension as the movie's characters.

Stolen Identity

A key aspect of the entity in *It Follows* is that it never takes the same form twice. Every time it appears on screen, it looks like a different person, from an old woman to a young boy. When it is explained to Jay how the entity works, it is mentioned that it can take on any form, even that of people she knows. However, as the film progresses, the entity always takes on the form of strangers, which allows Jay, as well as the audience, to easily identify them. **Video Example 4.10** shows the first and only instance where the entity appears as someone Jay knows, which also coincides with an instance of timbral incongruence. Video Example 4.11 shows the beginning of the beach encounter shown in Video Examples 4.4–4.7. As one of Jay's friends walks away to go to the bathroom, the shot shows someone walking towards Jay from a distance. This person is one of Jay's friends who has not appeared in the scene yet, and this, coupled with the lack of music, serves to disarm the viewer since the entity has only appeared as strangers up until this point. The scene continues as normal until 0:21, where the same friend seen walking towards Jay is shown to actually be swimming in the water. It is also at this point that a quiet, noisy timbre starts playing and slowly gets louder. The face of the swimming friend is obscured, and so it is very easy not to recognize them as a viewer and realize that something is wrong.

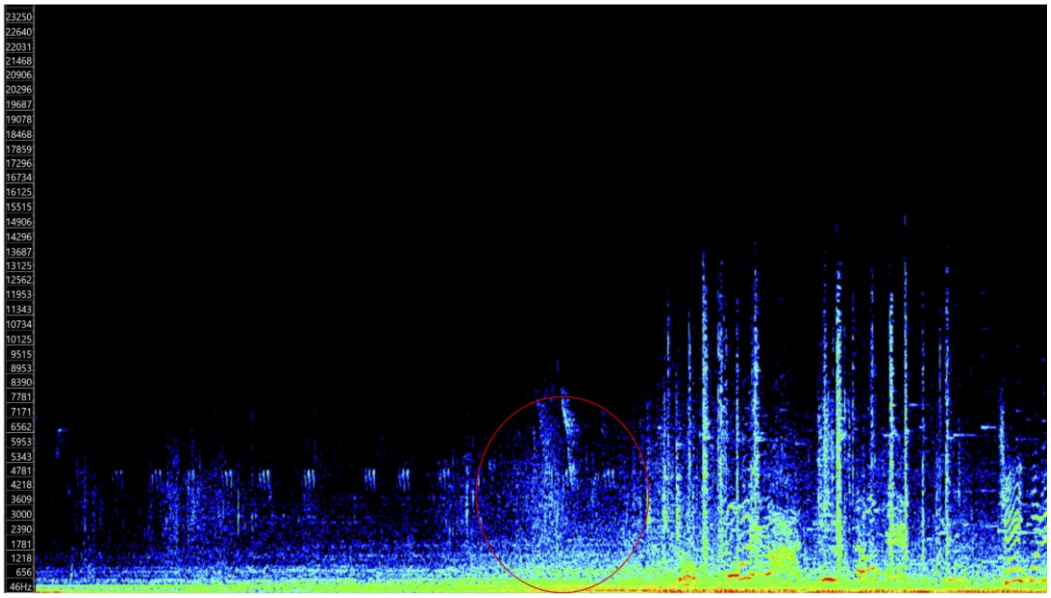
Video Example 4.10. A clip from the beginning of the beach encounter scene in *It Follows* (2014). As Jay's friend leaves to go to the bathroom, another one of Jay's friends, previously unseen in this scene, walks towards Jay.

This is an instance of timbral incongruence that hints to the viewer that something is wrong, even if they are unable to realize that there is one more person present than there should be. The timbre heard is noisy, which has previously been used to signify the presence of the entity. This feeling of tension created by the music, combined with it being unclear who the

person swimming is, creates the audio-visual contradiction. At this point, the viewer would have noticed the timbral incongruence combining ominous music with a mundane scene, resulting in a feeling of terror. This is especially reinforced by how quiet the noisy timbre is since every previous encounter with the entity has been clearly marked by the presence of the danger leit-timbre. **Video Example 4.11** shows the next couple of seconds from the same scene as Video Example 4.11. The person swimming calls out to her friends, and right as she does, dark, noisy drums are heard, which is an example of the danger leit-timbre. As Jay's friend speaks, the viewer recognizes her voice and realizes that the figure walking towards Jay is, in fact, the entity stealing her form. If the viewer still fails to recognize the swimming friend, the usage of the danger leit-timbre clearly signifies that the entity is approaching Jay. **Video Example 4.12** shows the entity reaching Jay and grabbing her hair. As it does so, the quiet, noisy timbre heard earlier increases in both aspects before giving way to a loud, dark, noisy bass. **Example 4.7** shows a spectrogram of the audio from Video Example 4.13.

Video Example 4.11. The next couple of seconds that occur after Video Example 4.13. The entity approaches closer to Jay, who is unaware of the danger.

Video Example 4.12. The next couple of seconds that occur after Video Example 4.12. Jay's hair is grabbed by the entity. We see this from the point of view of Jay's sister, who cannot see the entity.



Example 4.8. A spectrogram showing the frequency content present in Video Example 4.13. The noise seen at the beginning becomes dark and noisier towards the end, seen as the thick red lines. The circle shows the point right before the bass enters.

The increase of noise between the timbres as the entity gets closer to Jay lines up with the danger, chase, and proximity leit-timbres, but rather than the timbres becoming brighter as the distance gets smaller, the last timbre heard is the darkest. This coincides with the fact that while the entity is attacking Jay, they are invisible to the viewer. This is because we are seeing from the point of view of Jay's friends, who have, for the first time, seen clear proof of the entity's existence. The darkness of the timbre plays on the visual metaphor of bright vs. dark, with dark timbres having been shown to be associated with darker colors (Liu et al 2021). From the point of view of Jay's friends, the monster is literally "in the dark", that is, unable to be seen. The timbre heard while Jay is attacked is the proximity leit-timbre, which has gone through a transformation from bright to dark. The noise conveys tension and corporeality (Leydon 2012, 6), signifying that Jay's friends are now seeing proof of the entity's existence, but the darkness conveys the sense of confusion from not being able to actually see the entity.

Jay and her friends seemingly succeed in killing the entity at the pool, and the danger, chase, and proximity leit-timbres do not make another appearance. There still is the lingering doubt that eats at both the audience and Jay, and the characters seem anxious after the climax. Jay decides to start a relationship with one of her friends who has been shown to have a crush on her, and the film ends with them walking hand in hand while someone walks towards them from behind. Although the danger leit-timbre is not present during this shot, there is still that doubt. The use of timbral incongruence throughout *It Follows* creates an underlying fear and dread that puts the viewer in the same headspace as the characters. The timbres present in the danger, chase, and proximity leit-timbre reinforce this feeling of fear as well as cause the viewer to embody the danger felt by Jay when the entity is close.

Conclusion

In this thesis, I contributed to the scholarly conversion of timbral analysis by demonstrating that timbral adjectives alone can contribute to musical meaning separate from sound-source identification. I introduced the binary adjective pairs used by Megan Lavengood to identify timbral attributes, focusing on the ones better suited to identifying subtractive synthesizer timbres. I then showed how timbral adjectives can convey meaning both through different schemas as well as the ASPECS model established by Zachary Wallmark. After this, I expanded on the concept of leit-timbre by showing that combinations of timbral adjectives can be used to signify narrative elements in a given work. I then established the concept of timbral incongruence, where a contradiction is present in the audio-visual relationship of a film or video game, where timbre is the most salient feature creating that conflict.

The analysis of the synthesizer timbres used in both *Hyper Light Drifter* and *It Follows* demonstrates how timbral adjectives, free from sound source identification, can be used to reinforce the narrative of a video game/film. Timbral adjectives, both by themselves and in combination with one another, can signify thematic and narrative elements (leit-timbre), and can also be used to create audio-visual contradictions that can alter or reinforce a viewer's interpretation of the story (timbral incongruence). Identifying the cultural connotations of a sound source is also valuable, but should be used in combination with a discussion of the timbral adjectives present rather than entirely relying on the identification. In the future, I wish to apply the same type of timbral analysis to acoustic instruments and use it in conjunction with indexical function to add a deeper understanding of timbre's function. It is my hope that my analysis of timbral incongruence and leit-timbre, as well as the focus on synthesizers, has demonstrated the narrative function of acousmatic timbre.

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