

INFLUENCE OF EMOTIONS: HOW A FILM SCORE AIDS AUDIENCE
ATTENTION AND UNDERSTANDING IN DOCUMENTARY FILM

by

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ABSTRACT

The music that accompanies documentaries often needs to be more valued and utilized. Although documentaries primarily focus on facts or discoveries, their musical scores, which are often secondary, house the emotional nuances and sensitivities that are the true key to their meaning and impact. Intentionally crafted scores—as the emotional undertone—draw viewers into the inner world of the film. By maximizing intellectual stimulation through the visual means of film and auditorial means of music, there is a greater chance for audience attention and understanding. This thesis seeks to examine original scores within documentary films, applications pertaining to learning capabilities, and the proper execution within documentary context to direct attention of the viewer. I include a case study using my science documentary film *Holy Curiosity: Uncovering the Expansion Rate of the Universe* to assess the effectiveness of sequences in aiding audiences' attention and understanding of complex scientific information through its original musical score as a structural device. Ultimately, documentary films employing an original film score may garner increased audience attention and understanding.

CHAPTER ONE

INTRODUCTION

The use of sound design, especially musical scores, within cinema has steadily evolved since the early 1900s. Before there was synchronous sound within a film, orchestras embellished dramatic beats and carried audience members through storylines. It was not until "talkies" became the standard for cinema (1920s term for films that have a synchronous sound) that orchestras could not only be used for adorning the cinematic landscape but so too could the human voice. Though using a unique musical score has been embraced by fiction films to enhance their plot points and emotional draw for viewers since before synchronous sound, music in the documentary film genre has not always had the same response. Holly Rogers, a Senior Lecturer in Music and Director of the Research Centre for Audio-Visual Media at the University of Liverpool, describes fiction films' implementation of music this way:

Since its earliest days, fiction film has been awash with music, its role; has often been theorized to lessen our awareness of the technological construct that unfolds before our eyes, to encourage us, the audience, to enter into a contract and believe, on some level and temporarily, that what we are watching is real. To do this, edits, geographical and temporal cuts, and evidence of the mechanics behind the film must be concealed, something easily achievable through a continual flow of synchronous sound. In addition, well-placed music can draw out a narrative, highlight the aesthetic strands between scenes, focus attention on one thing to the exclusion of others, and help promote intense aesthetic bonding with certain characters or themes. Whether music is concealing editing cuts, or heightening emotion, however, its main role is to remove an audience from the auditorium and transport them into the heart of the story. And herein lies the paradox: our everyday lives are not ordinarily accompanied by music. We can recall Hitchcock's question to the composer of his 1944 film *Lifeboat*, David Raskin: "But they're in a lifeboat out in the middle of the ocean; where's the orchestra?" to which Raskin replied, "behind the camera!" *Yet, in fiction films, music is used to help us believe that what we are watching is real and encourage us to develop empathy with the characters* (Rogers, 2013, p. 4).

Given Rogers's observation about how the music used in fiction films helps audience members believe that they are watching something tangible, how much more should documentary films implement music to facilitate what is actually true? This is not, however, often a widely accepted option or framework when developing a documentary film. What would a documentary film be without music? Kay Dickinson, a professor of Film Studies at Concordia University, Canada, suggests that to understand music's importance in cinema, we must first imagine a film without any music.

The majority of filmgoers would not be able to tell you much about movie scores. Even if you were to catch a group leaving a movie theatre and ask them about the score they had just heard, many would admit to not really having noticed it. However, if the same ensemble had been asked to sit through that material minus the music, they would probably feel frustratedly disconnected from the film and its characters precisely because of the lack of musical prompts to guide them towards a set of expected responses (Dickinson, 2003, p. 13).

Debates about a documentary film's authenticity and aesthetics can often be considered rivals. Can a filmmaker use sound effects to supplement when the natural sound is indistinguishable? Can music be infused into a sequence to enhance the emotional tension a subject feels? These questions though, handling different aspects of the filmmaking process, underscore the critical question, "Does this hinder the truth?" Bill Nichols describes the genre of documentary's handling of truth in terms of reproduction versus representation:

Were documentary a reproduction of reality, these problems would be far less acute. We would then simply have a replica or copy of something that already existed. *But documentary is not a reproduction of reality, it is a representation of the world we already occupy.* Such films are not documents as much as expressive representations that may be based on documents. Documentary films stand for a particular view of the world, one we may never have encountered before even if the factual aspects of this world are familiar to us (Nichols, 2010, p.13).

Though one of the most significant concerns within a documentary film is whether the truth is present, a more specific question filmmakers should ask is whether this film allows

audience members to experience a world that they may have never encountered. The essential question for a documentarian is how music can immerse the viewer into the heart of the story (Rogers 2013).

Filmmakers have dozens of tools at their disposal to engage audience members. The aim this paper seeks to discover is how music can bring viewers into the world of a film. For the duration of this paper, it is shown that documentary films will increase their audience's attention and understanding by investing in a proper original film score. First, by looking at music's use as a stimulating learning tool; next, by examining the power of music to provide structure and emotional nuance to a story. Finally, this paper analyzes a case study of my film, *Holy Curiosity: Uncovering the Expansion Rate of the Universe*, to evaluate the effectiveness of sequences and their underlying tones through technical elements of the score.

CHAPTER 2

BRIDGING THE GAP: FILM MUSIC AS AN IMMERSIVE LEARNING TOOL

Before comprehending how music in a film is a powerful learning tool for audiences, it must be understood how film can be used as a learning method. Film is a unique medium in that it utilizes two dominant senses – sight and sound. Sight and sound, or auditory and visual, are two of the four learning modalities (the others being reading/writing and kinesthetic). Learning modalities are the various delivery methods used to engage individuals (Rothe 2013). Knowing this, filmmakers can reach a more significant number of individuals with various learning styles by employing two learning modalities. Additionally, film can present a complex topic through various auditory and visual means. Collectively, we have seen this at work within academia:

Visual media can serve as a means of incorporating different learning modalities: film can aid students who are primarily visual learners by making the necessary course material more accessible. Movies can serve to bridge the gap between abstract and distant cases and can also act as an enhancement to information portrayed to students in other formats (Rothe 2013, p. 228-229).

Across disciplines, teachers use distinct forms of multimedia to engage students. Moreover, when teachers used a “low-cost” educational film, there was a noticeable increase in motivation and interest in the material. These types of films are shorter and have a specific learning goal in mind (Bravo 2011). In a study conducted by the Technical University of Catalonia, Barcelona, Spain, a group of researchers studied the use of educational films within classroom curricula of 12 lectures of 487 students in three different engineering degree tracks. Unanimously, the classrooms that implemented “low-cost” educational films had an increase in student motivation and interest in their relevant subject. Specifically, this gave students “a sense of satisfaction for a well-done job and encouraged them to continue working on educational

innovation, fostering continuous improvement” (Bravo 2011). The classroom curriculum, or more broadly, the stories communicated by these “low-cost” educational films, were able to engage viewers effectively. A key aspect to note in this study is the “sense of satisfaction” among the students watching the videos. The ability to provide audience members with the relief of understanding is a significant motivator for cognitive retention. Providing a framework that serves as a roadmap for the viewer increases the likelihood that students will retain the message(s) successfully. These results mean that not just any educational film can be used and be expected to have an impactful result among its viewers. It is a film with a clear learning objective articulated to its audience. In other words, the film must have a cohesive storyline to enact understanding most effectively.

One of the most exciting aspects of implementing film into classroom curriculum is that it aids students in “sensory immersion that helps learners grasp reality through illusion” (Dede 1995). As Rogers notes, “In fiction film, music is used to help us believe that what we are watching is real and encourages us to develop empathy with the characters” (Rogers, 2013, p. 4). Film, whether fiction or nonfiction, can break down the boundary of the reality of the ordinary by bringing students into a more engaging environment. It is noted across multiple sources that film is one of the most effective means of communicating stories (Abrahamson 1998). Humans have used stories to communicate for thousands of years; unsurprisingly, it has become part of our species’ experience, and this mode of imparting information is hard-wired in our brains.

Before there was recorded history, there was storytelling. Early storytelling came from folk songs, fairytales, and oral traditions (Abrahamson 1998). These stories ensured that the next generation would remember the wisdom and history of the previous. Crucially, the tool of

storytelling has been able to provide “a measure of order and stability to human societies for countless millennia. It appears through a review of the literature that the story is one of the most important inventions of humankind” (Abrahamson 1998).

A particular thread of storytelling throughout human history is the employment of rhythm and song; this is ubiquitous among cultures. It is unclear what was music’s specific origin; however, one thing is certain — music is a part of the human experience (Levitin 2006). Likewise, just as a film can be a learning tool, so is music. From a young age, kids are given nursery rhymes and songs as a means of learning. Take, for example, a child learning his or her language’s alphabet. Within the American context, the song to memorize the alphabet is the same song music as the nursery rhyme “Twinkle, Twinkle Little Star.” With the support of the right music buttressing the concept, children are set up to learn better. Even as adults, large series are hard to remember without using a mnemonic device or pattern. As Lucille M. Foran, director of education at Latham Centers in Brewster, Massachusetts, puts it, “Music exercises more parts of the brain than almost any other single activity. Especially for children with learning problems, listening to music appears to help students access parts of their brains that function poorly or not at all” (Foran, 2009, p. 56). Music has a distinct ability to stimulate various areas of the human brain for learning. Alternatively, as Levitin puts it:

The story of your brain on music is the story of an exquisite orchestration of brain regions, involving both the oldest and newest parts of the human brain, and regions as far apart as the cerebellum in the back of the head and the frontal lobes just behind your eyes. It involves a precision choreography of neurochemical release and uptake between logical prediction systems and emotional reward systems. Your brain on music is all about...connections (Levitin, 2006, p. 188).

Furthermore, since music is quintessential to the human experience, it has a democratic component to it concurrently. Songs from different cultures can be listened to and understood for

their emotional purpose, regardless of language barrier or social class. This ability not only allows for cross-cultural engagement but also understanding. Music is the glue that can connect the past with the present, cultures across the world, and basic human cognitive learning skills (Abrahamson 1998).

Now, with film and music both being solidified agents in learning, one must wonder, how powerful of a tool could they be together if used properly? By maximizing intellectual stimulation through the visual means of film and auditorial means of music, there is a greater chance for audience attention and understanding. To a filmmaker, there is a story crafted visually through shots and sequences, but there is also a story within the musical landscape to be crafted beneath the surface.

Example: The Thin Blue Line

Two documentary films that play with the boundary of a musical score to engage audiences are *The Thin Blue Line* by Errol Morris and *Particle Fever* by Mark Levinson. First, *The Thin Blue Line* is a film that seeks to uncover how a wrongly convicted man was framed for murdering a Dallas County police officer. The film score of *The Thin Blue Line* was composed by Phillip Glass. Phillip Glass was best known for being an experimental classical composer and had only composed for the experimental film *Koyaanisqatsi*, which will be discussed later in this paper, before the making of *The Thin Blue Line*. It was not until after *The Thin Blue Line* that Phillip Glass composed music for more films, such as *The Truman Show* by Peter Weir and *The Fog of War* by Errol Morris.

A distinctive aspect of Phillip Glass's music is that his scores are relatively minimal and built with repetitive layers. These "relatively minimal" scores do not mean that Phillip Glass's

compositions lack emotional expressions. In the case of *The Thin Blue Line*, the music is consistent by only implementing a handful of musical bars. The music establishes the rhythm of the storytelling for Errol Morris. More specifically, the musical score's consistency and stability contradict the inconsistent and clashing stories of some of the interviews. Errol Morris uses a repetitive film score, almost like a fiction film allowing him to establish the narrative rhythm and transition smoothly into new sequences. An example of how Errol Morris uses Phillip Glass's score within the film to illustrate the interviewee's inconsistencies is during the police officer's murder reenactment. Audience members hear the same repetitive soundtrack but do not see the same exact scene each time. The reenactment scenes change with the shifting stories of the interviews. Cognitively, an audience member is experiencing dissonance when watching *The Thin Blue Line* throughout these scenes. Additionally, through the cyclical nature of the music and reenactments, Errol Morris can also emphasize the repetitiveness of detective work. They have grown used to hearing the consistency of the music but are visually left unsatisfied with the same continuity on the screen; therefore, Philip Glass can stimulate more parts of the viewers' brains for a greater likelihood of audience understanding (Levitin 2006).

One of the film's most compelling points is when there is no music; in this pivotal point, Errol Morris and Phillip Glass use silence to engage audience members. There is no music when Errol Morris interviews or shows people working on the case. For instance, when Randall Adam's attorney is on screen, there is no music playing in the underscore. In her interview, she describes how she believes that Randall had been wrongly convicted due to a lack of quality evidence. The absence of music with Randall's attorney on the screen allows audience members to focus on the words she is saying. In this way, the use of silence directs the viewers' attention

to the character's explanation. Phillip Glass's music enriches Errol Morris's storyline by incorporating different learning modalities. First, the learning modality of visual learners with seeing the various accounts in the reenactments while hearing the same music. Second, addressing the auditory learning modality by using the lack of a score under the truthful interview. This absence of music punctuating the scene indicates to the brain that a change has occurred (Foran 2009). This tonal change can find its resolution in the truth articulated by Randall's attorney among the obfuscation of the other interviews. Morris's use of both sight and sound compels audiences to subliminally conclude and direct the audiences' attention to the innocence of Randall Adam before it becomes apparent in the film.

Example: Particle Fever

The film *Particle Fever* follows six scientists during the launch of the Large Hadron Collider to recreate conditions from the Big Bang Theory. Robert Miller, who has scored music for films and commercials, had an essential job throughout the movie to make the content accessible to viewers. He said, "The most challenging part was making the high-minded science relatable to a broad audience. It is important not to pander in the process, so I looked for a nice balance [of music] and was happy with the result." The editor of *Particle Fever* was Walter Murch. Walter Murch is a film editor, director and sound designer predominantly in the fiction film world. Before *Particle Fever*, Walter Murch worked on films such as *Apocalypse Now*, *The Godfather I, II, and III*, and *American Graffiti*. Walter Murch's appointment on the film was to invigorate the storyline of *Particle Fever* through its editorial structure and auditorial landscape. He achieved this through the film's pacing, the persistent ticking clock through suspenseful sequences, and animations accompanying dense scientific topics.

Mark Levinson and Walter Murch accompanied each scientist with their backstories of involvement in the Large Hadron Collider. These individual backstories allow viewers to see the scientist on screen in a more personal light. Fabiola Gianotti, an experimental particle physicist and Director-General at CERN in Switzerland, is presented with her studies in music before becoming a physicist. Gianotti states, "There are many similarities between music and physics. Classical music follows rules of harmony which are really rules of physics and mathematics." This statement encapsulates how Robert Miller and Walter Murch used the musical score underneath the film. In calculated qualities, Robert Miller used various bars of dissonance in the musical score to strike tension among viewers or periods of repetitive wind instruments to invoke curiosity. These two music techniques of repetition and dissonance are reoccurring leitmotifs, musical ideas or arrangements of notes assigned to a theme or individual, throughout the film.

One way Robert Miller achieved his goal of making “high- minded science relatable to a broad audience” was by composing music that demonstrated sentiments of the scientists throughout the launch of the Large Hadron Collider. At the film's beginning, Monica Dunford, a postdoc student on the Atlas Experiment, is introduced to the audience. She explains the experience of seeing the Large Hadron Collider and says, "I can remember walking in and just being stunned. People tell you, 'Oh, it is five stories tall.' And then you see five stories completely filled with microelectronics – all custom designed — all hand-soldered. It is like it is a five-story Swiss watch." As viewers, the only indicators of Monica Dunford's first reaction to the Large Hadron Collider come through her words. At the same time, the music cue titled "A Five Story Swiss Watch" starts at the beginning of her retelling. Visually, audience members see the tunnel that leads to the Large Hadron Collider. When revealing the Large Hadron Collider,

the simple score turns into a dynamic, full orchestra sound to match what audience members see on screen and Monica Dunford's reaction. Audience members, through the shifting tones of the music, emotionally experience the sudden change in musical dynamics, signaling auditorily to viewers the scale of the Large Hadron Collider and the scale of Monica Dunford's reaction.

Robert Miller can demonstrate the grandeur of the Large Hadron Collider and the inner world of Monica Dunford. The original score deepened the storyline of *Particle Fever* through its musical expressions of the human experience.

CHAPTER 3

BENEATH THE SURFACE: MUSIC AS THE EMOTIONAL STORYLINE

In his journal publication *Sounds Real: Music and Documentary*, John Corner describes the relationship between music's role in a documentary as "both a sense of risk and of possibility" (Corner 2002). More expressly put, Corner continues:

Music is regarded as primarily emotional in its effects, either by way of signaling appropriate levels of emotion or, more indirectly, by providing support for an interiority which cannot itself be visualized or perhaps even spoken ('inner life'). There are some awkward questions raised by this, certainly. How are we to judge the 'falseness' of an emotion and by what independent means will the conditions of 'inner life' be available to producers so that they may be secure in indicating it musically? (Corner 2002, p. 358-359).

According to John Corner, the use of music is not clear cut, and there is no "one-size-fits-all" when designing the score for a documentary film. When writing an original film score, how can composers or filmmakers know exactly what a character in a film is feeling? The subjects of films have a complex set of emotions. There is a high risk to composers and filmmakers when trying to portray an individual's emotions. A composer or filmmaker could be wrong in their judgment. Although, when a proper amount of conscientiousness is used to craft the music that will accompany a documentary film, the possibilities far outweigh the risk. The inherent risk of a misrepresentation of emotions to film viewers does not outweigh the immense possibilities of engagement that a musical score can employ by maximizing the audience members' intellectual stimulation. Therefore, the importance of music within documentary films cannot be understated.

In the Internet age, there has never been an easier time to source stock music for a documentary. Understandably, easily accessible stock music has its benefits, is more cost-effective for lower-budget documentaries, and has less time delay when implementing music into

an edit. Using John Corner's framework, when the filmmakers find the balance in evaluating emotions and pairing music appropriately, the reward is a far more compelling story. Having creative control of an original score, which stock music does not allow for, a filmmaker will more precisely evoke the emotional core of a film.

Picking the Right Genre

The particulars of music's influence on emotion could be a topic explored on its own. The following examples of music theory and its elements are not exhaustive but provide a starting point for further exploration. Fundamentally, when shaping a score for a documentary film, a composer must establish the musical style or genre. A musical genre is the primary musical classification or tradition to categorize an arranged song. This guideline does not mean that there must be a singular genre throughout. Typical genres include classical, rock, pop, jazz, or techno. By understanding which genre a documentary should use, the filmmaker allows audience members to gain more than just a song carrying them through their time watching the film. A genre can signal to a viewer the historical period, geographical place, or cultural representation in a storyline (Corner 2002). For example, a documentary set in New Orleans would favor its score with a jazz influence. Maybe that documentary is about present New Orleans; in that case, a composer might infuse some modern jazz to frame the film more accurately. Sometimes there are better fits for a documentary film than the most obvious genre. A particular subject or individual might cater to a specific musical style.

On the other hand, using a contradictory genre than expected can achieve a different emotional response. For instance, arrangements for science documentaries are often influenced by modern techno-influenced genres. Perhaps someone on screen is trying to articulate the long

history of a science field, so instead of a techno-infused song, a song with more classical elements might be more fitting to go along with the nature of the content. Supporting a film's storyline by the genre of music chosen, or mixing styles of music genres, can emphasize contradictory emotions or humor in the correct context.

Music Fundamentals

Once a documentary's musical genre(s) is established, more technical aspects of musical cues can be made for a specific sequence. These aspects build up from the genre and subsequently add expressive details to the emotional storyline of a film. Primary to building a film cue is the written key. A key is an established grouping of notes with a central note. Keys in a Major arrangement (such as C Major, D Major, and G Major) can express but are not limited to, emotions such as delight, awe, or achievement. Minor keys (C# Minor, B Minor, C Minor) communicate uneasiness, morning, sadness, or patience. Furthermore, the time signature (the number of beats each measure in a musical score is assigned) or tempo (the performed arrangement pace) can communicate to its listeners a sense of urgency with quicker pacing with a rapidly appearing note progression or a sense of distrust if those same number of notes at a slower pace (Levitin 2006).

By building on keys, time signatures, and tempos, composers can add more stylistic choices to film cues. Did a subject in a documentary film say something that is entirely contradictory to other subjects in the film? A couple of measures of dissonance (when two or more notes played clash simultaneously) might help to communicate this contradiction to viewers. Was there just a resolution of tension in a discovery? Using the dominant relationship between chords with a tonic as a resolution will not only help resolve the storyline but also the

feeling of resolve in the music. Perhaps the dominant relationship between chords is not precisely what is needed to embellish a resolution within a film. Changing the dynamics, or volume, would suffice. Lastly, in a documentary, something that appeared on screen was unexpected. A grace note, or a note used to articulate or accent the note that follows it, would be helpful to punctuate what is on screen (Levitin 2006). These consistent or shifting elements, from broadscale key signatures to subtle grace notes, of a score can carry audience members through various film sequences. In these various sequences, a composer can help build the story's structure. These are but small examples of the endless possibilities of musical cues within a film sequence.

Lastly, the final element to explore is musical themes or leitmotifs. A leitmotif is a musical idea or arrangement of notes assigned to a theme or individual. Leitmotifs can be enhance meaning in a documentary score if used strategically. Separate leitmotifs can be assigned to various characters giving viewers hints as to whom they might see on the screen next. More broadly, leitmotifs can punctuate a thematic element found within a story. From an editing perspective of a film, leitmotifs can allow filmmakers to create callback storyline arcs to previous ideas, themes, or people. Leitmotifs are not exclusive to film scores. Leitmotifs are across numerous eras of music. Pyotr Ilyich Tchaikovsky, a Russian composer of the Romantic period, uses leitmotifs throughout his compositions. One of Tchaikovsky's most famous examples of leitmotif is in his music for *Swan Lake*. The "Swan Theme" is only first introduced at the end of Act 1 with the introduction of the swans at night. The "Swan Theme" then mixed throughout Acts 2 and 3 in different tempos and key arrangements, communicating a wide variety of emotional story arcs of the characters on stage to audiences (Frey 2018). Leitmotifs

quickly made their appearance in the cinema. In the first era of sound in cinema, the classic period of Hollywood, Erich Wolfgang Korngold, Bernard Herrmann, and Max Steiner all strongly influenced the use of leitmotifs in film.

Conclusion of Musical Technique

Music can and should be one of the first things filmmakers incorporate into their sequences to create stronger storylines. A musical genre can help ground historical and cultural context, or leitmotifs can musically signal important information, people, or themes to audience members. Further, the music found within a documentary film is crucial for giving viewers unique access to the "inner lives" of the subjects on screen, such as those in *The Thin Blue Line* and *Particle Fever*. This emotional access to the subjects on screen can come from the cues' musical genre, metering, dynamics, key signatures, or leitmotifs, as stated in the previous examples of musical fundamentals and proper genre implementation.

Composing a documentary is more complex than designing a score to drown out background noise. This boundary between the audiovisual world in documentaries' highest potential comes from musical scoring with total control of its technical implementations. As John Corner said, "A more varied, inventive and risk-taking employment of music within television documentary would be a welcome part of the wider and continuing exploration of the role of art in the quest for understanding." As much as a storyline in a film is factual, it is also emotional. By expanding intellectual engagement through the musical score's technical uses, viewers will have an easier time understanding documentary films through musical cues.

CHAPTER 4

CASE STUDY: HOLY CURIOSITY

The remainder of this paper will be a case study of the musical cues within my science documentary, *Holy Curiosity: Uncovering the Expansion Rate of the Universe*. This film was produced as part of the degree requirements for the MFA in Science and Natural History Filmmaking Program in the School of Film and Photography, Montana State University-Bozeman. Composer Abbey Wenger arranged the musical cues throughout this film. The process of collaboration and Abbey's craftsmanship will be the focus of the following sections. Subsequently, the remainder of this paper will focus on the primary cues that demonstrate an attempt to incorporate some of the strongest examples of maintaining audience attention, understanding, and action by maximizing intellectual stimulation through the visual means of film and auditorial means of music.

Holy Curiosity: Uncovering the Expansion Rate of the Universe is a film about astronomers and astrophysics worldwide who are mired in a debate over the true value of an astronomical constant that, if solved, might radically alter our understanding of the universe around us. These scientists' relentless questioning, curiosity, and wonder about the universe lead them down roads they never thought they would be on in pursuit of reconciling the value of the astronomical constant, the Hubble Constant. In the film, fourteen musical cues help viewers connect with what they are seeing. This could be through the different emotions they see on screen, transitions into new film sequences, or even directing their eyes to something they might not have seen if there was no auditory cue. Moreover, the film has a consistent narration with the various interviews, so the music rarely has to carry the burden of the storyline alone. This

ongoing narration allowed for portions of contrast, either with no narration and just music or no music and no narration, to call attention to essential elements of the storyline in the film.

The examples given are not an exhaustive list of how much this film's storyline benefited from a personalized music score but more accurately, are a representative collection of instances where music served as an excellent stimulus. *Holy Curiosity: Uncovering the Expansion Rate of the Universe* would not have been a successful film if it were not for the original score. Audience attention would undoubtedly diminish due to the film's drier, more theoretical focus, and comprehension would have come at a cost. Prioritizing a custom-made score for the film was one of its most valuable investments.

Holy Curiosity's Foundational Elements

Since this is a science film, and a science film on astrophysics, an ill-thought-out answer to the question of genre choice might have been a mix of techno-infused songs. Even though techno would work perfectly well for some of the musical cues, an element emphasized throughout the film was the human characteristic of curiosity. Naturally, the music also needed to incorporate other elements of a human-like quality. The final consensus was to have genres throughout the film that implemented both orchestra and electronic-influenced sound. The orchestra and electronic-influenced sound would be the foundational elements where all other technical choices would be rooted for the musical storyline (Corner 2002). This idea did not come randomly; there were also additional verbal and visual elements within the film to hint at a shared humanity with the audience. An example of "humanizing" the interview subjects visually was having them all sit center frame looking directly into the camera so audience members could feel as if they were conversing with the scientist on screen (Figure 1). *The Thin Blue Line* is

another film example that uses a similar method of having the interview subjects look directly into the camera so audience members feel as though they are in the same room as the individuals on screen.

Within the film's first musical cue, audience members hear Dr. Jennifer Wiseman's voice talking about her awe and wonder about the universe. Visually they are met first with vast, expansive shots of the universe before being brought down to earth and introduced to Dr. Jennifer Wiseman in the story's first chapter. In this section, the central theme the music conveys is not the sheer magnitude of the universe but rather humanity's interest in the universe. This usage of the musical score was again an attempt to reinforce further the innate humanity of the subject and the storyline. That is why a piano is one of the main instruments within this sequence. With the piano's fluttering style and quick tempo, the orchestral arrangement within the background can be "brought back down to earth," just like the images on the screen. Finally, the last central element used to help drive the genre of the techno orchestral were the plugins Valhalla Supermassive and Forbidden Planet. Each plugin was used over one hundred times throughout the film score to influence style, such as adding reverberation. Valhalla Supermassive is a plugin that can take simple echoes and transform them into resonant echoes. Resonant echoes can create a fuller-bodied and smoother sound in the musical score that is more immersive to audience members than a simple echo. Instead of repeating a single note on a loop, resonant echoes can expand and contract seamlessly between notes. Forbidden Planet is a plugin that can affect the sound of specific instruments' attack and release effects. For instance, when designing a midi soundtrack for a musical film, a computer-generated violin will have the same bowing patterns when playing a score. Forbidden Planet is used to change those bow patterns so

it sounds like a live orchestra with many artists playing. Simply put, *Forbidden Planet* is used to augment computer-generated sound to present as real-life performer.



Figure 1: A-E are example images from the interview placements of the film *Holy Curiosity: Uncovering the Expansion Rate of the Universe*. Subjects are placed in the center of the frame within their personal environments.

Curiosity Leitmotif

As stated, a leitmotif is a musical idea or arrangement of notes assigned to a specific theme or individual and is incorporated predominantly within the original fiction film scores.

Koyaanisqatsi, though, is a nonfiction film directed by Godfrey Reggio that heavily leans on its

musical scoring by Philip Glass to establish leitmotif themes. *Koyaanisqatsi*, a Hopi Indian word meaning "life out of balance," is a nonverbal film that illustrates an apocalyptic vision of the natural world and modern technological worlds colliding. This film has no principal characters, dialogue, or concrete narrative, which makes the music the primary means of defining the film's structure. *Koyaanisqatsi's* central leitmotif is established when an arpeggiated organ arrangement is introduced when the imagery on screen shows a rocket taking off from a launch pad. This simple and repetitive arpeggiated organ leitmotif is used throughout the film and layered upon additional arpeggiated instruments. This tactic provides both structure and emotional weight.

The music cue "Microchips" is an example of where the arpeggiated organ leitmotif returns in a different tone after a couple of minutes of almost silence. This music cue is visually preceded by quick-paced satellite imagery of cities before switching to slower shots of various people working. This change in visual and musical tempo is jarring to viewers, making the people on the screen appear depressed in contrast to the previous, fast tempo pace of the leitmotif used in other musical cues and the near silence punctuating the last scene. The music cue "Ending" comes quickly after "Microchips" with the reintroduction of the rocket taking off from the launch pad. The arpeggiated organ returns as well, however, this time with base vocals. The arpeggiated organ leitmotif in *Koyaanisqatsi* acts as chapter markers throughout the film, allowing audience members to focus on visual and emotional contrasts in a film that would be relatively unnoticeable if the film did not contain any music. They also allow Godfrey Reggio to interact with viewers' auditory recall of previous scenes in the film. The tension and anxiety can be drawn out within the high-tempo arpeggiation and sadness when contrasted with slower arpeggios. Though *Koyaanisqatsi* is an experimental nonfiction film, it is inherently poetic,

allowing audience members to come to their own intellectual and emotional conclusions. The film's success can only be assessed with its original musical score to guide and anchor audiences. The repetitive arpeggiated organ leitmotif is one of Philip Glass's most profitable music uses to engage viewers' emotions and attention throughout the different chapters he establishes in the film.

As for *Holy Curiosity*, the piano, introduced in the opening sequence, is the central leitmotif of the film used to emphasize the idea of curiosity within many sequences in the storyline. The different types of stars scientists use to gauge distances (specifically Cepheid Variable and Type 1a Supernova stars) in space inspired the piano arrangement. This leitmotif has two major seventh chords, a fourth apart from each other. The first is a Cmaj7 but inverted to start on the E (specifically E-G-B-C with E-G-B as the minor chord). Adding the C into the chord brightens the arrangement and gives it a magical feeling. The second chord is a Fmaj7 chord, starting on the A (A-C-E-F). Similarly, the first three notes are a minor chord, and the F note brightens it at the top of the progression.

The quick-paced piano's purpose is to emphasize the beauty that can be seen on screen as well. Additionally, most of the animations that are playing while this piano leitmotif is occurring have some form of dynamic motion. This motion could be a simple rotation of the star left to right, gradual push-in of the frame, or movement of the stars themselves. The intent of having motion on screen with the piano leitmotif is to make audience members feel like they are near these stars. One of the strongest examples of the curiosity piano leitmotif is when Dr. Wendy Freedman explains her involvement in using a type of star called a Cepheid Variable to measure distances in space during the music cue entitled "The Cepheid Test." While audience members

hear Dr. Freedman explain what makes these stars unique, they also see animations visualizing her words. These animations have subtle movements intending to draw viewers' eyes to the stars themselves and evoke a sense of wonder and intrigue.

The intent of using of a leitmotif within this science documentary was not just to help viewers understand the various emotional nuances; it is also a strategy to help comprehend potentially foreign concepts through a recognizable, repetitive musical landscape. The recurring leitmotif gives viewers a sense of familiarity, thus increasing the likelihood of the audience connecting with the content. By pairing this leitmotif with the facts, discoveries, or important conceptual concepts, audience members are given musical clues to things they need to remember to understand the rest of the film. Similarly to *Koyaanisqatsi*, use of a repetitive leitmotif throughout its original score, the seemingly structureless film can be given a format for viewers to listen for and engage with for a greater probability understanding.

Directing Audience Attention

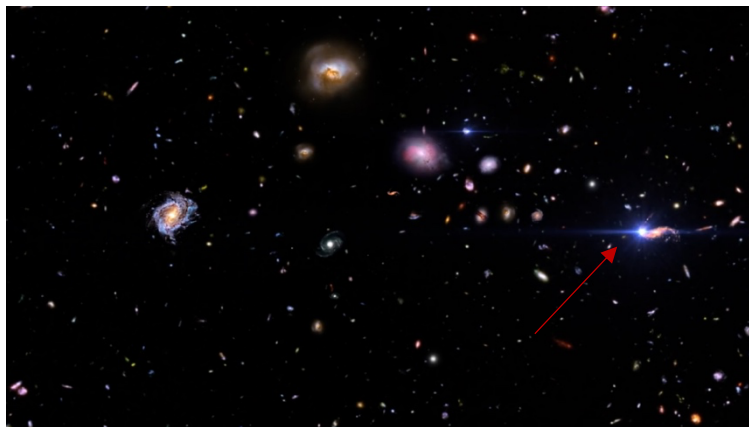


Figure 2: Frame from the film *Holy Curiously: Uncovering the Expansion Rate of the Universe*. Within the frame there is an arrow (not in film) pointing to a supernova star. This exploding star was accented by a piano note for audiences.

Another key element of the musical cues throughout the film was to direct the audience's attention to different areas of the film screen. An example of this can be found during the musical cue "How 'bout Negative Matter?" In this sequence, Dr. Adam Riess describes how Type 1a Supernova behaves. On screen, audience members see different exploding stars within a larger frame of galaxies (Figure 2). Since these exploding stars are small for the frame, a single piano note accents when there is a Type 1a Supernova explosion in the frame. This strategy encourages the audience to look around the frame to see the direction from which the subsequent explosion might be coming. These subtle, single-note musical cues help keep the storyline pacing moving forward. By sprinkling in these cues the correlate to the audio, the viewer is encouraged to survey the screen.

Silence as Punctuation

Throughout the film, an absence of music motivates the film's storyline forward. It also allows for the segmentation of information in the film. Some instances of silence punctuating a scene are with large segments of archival footage. Introduced at the film's beginning, viewers see archival footage of Dr. C. R. O'Dell. Up until this point, there has been a consistent music bed. When viewers meet Dr. C. R. O'Dell, they only hear his words explaining how it is difficult to measure distances in space. His words are a chapter marker for the film's storyline.

The silence creates a gap in music, signaling to audiences that the information is essential for understanding the rest of the film but also to help them understand that they are moving onto a new section of the film. This use of silence as punctuation can also be seen in how the music from *The Thin Blue Line* and *Koyaanisqatsi* enforces contrast and change. For *The Thin Blue Line*, the silence enforced the contrasting testimonies, whereas *Koyaanisqatsi's* silence enforced

contrasting visual sequences and to act as catalyst, prompting audience members to understand they are moving onto a new section of the film. The contemporary music in *Holy Curiosity* returns toward the end of the archival clip of Dr. C. R. O'Dell, prompting the viewers that they are not only changing in the decade but also transitioning into a new section with contemporary ideas.

Relief of Discovery

Another way music enhanced the film's storyline is exhibited in sequences regarding "relief of discovery." These are pivotal areas of that film revealing a scientific discovery. The introduction of additional musical instruments helped to accent these moments. Specifically, these instruments had a dynamic, tempo, or time signature change to the score that preceded it. This change in dynamics, tempo, or time signature often occurred at a hurried or abruptly changing pace for short periods due to their distracting nature.

An example from the film where there is "relief of discovery" is when the expansion of the Universe animation appears on the screen for the first time. A quick-paced, rolling cymbal that is louder than the accompanying cello begins to play at the beginning of the animation. This "ah-ha" movement of the film with the rolling cymbal for two bars enriches the animation expanding on screen because the music calls attention to the articulated discovery. Akin to the music drawing attention to the exploding Type 1a Supernova on the screen by a single note, these technical musical changes draw awareness to the new information and signal that this is information that the audience must know to move forward in the understanding of the film. The quick-paced, rolling cymbal only appears for two bars to allow viewers to feel a sense of relief musically when the cymbal stops playing.

Insight to an Inner-World

One of the final, climactic musical cues within the film is the transition from the cue "The Hubble Tension" to "There's Something Off." The tone of the music used in "The Hubble Tension" is one of strain (in C Minor). Audience members hear the scientist on screen explaining the film's central conflict with no real answers as to when there will be a new scientific discovery. The music of "The Hubble Tension" subtly drops out, and Dr. John Mather is the only one left speaking. The absence of music allows for the silence to punctuate the storyline sequence. After Dr. John Mather finishes speaking, Dr. Wendy Freedman appears on screen with a smile to explain that "it would be more exciting if there would be new physics. We would all like to see new physics, but we also want to ensure that we are measuring what the universe is actually doing." At the same time, the tone of the music changes. Instead of the long, drawn-out, and tense string progression, there is upbeat, fast-paced electronic music. This lighter tone of music (in Eb Major) brings out hope within the scientist on screen and allows the audience members to understand the excitement and curiosity they have with their research. The music cue allows the emotional and storyline change its pacing.

The cue "The Hubble Tension" to "There's Something Off" was one of the most reedited arrangements in the film. Some of the first "There's Something Off" arrangements involved slightly darker tones. These early edits with darker-toned arrangements portrayed more conflict among opinions rather than the excitement of the unknown. A musical cue that exemplified the excitement of the unknown was better for the film's overall storyline, given that the following sequence would introduce the new technology of the James Webb Space Telescope and with it a sense of hope for new physics.

Holy Curiosity's Emotional Storyline

Ultimately, the influence of *Holy Curiosity's* original music score, as opposed to implementing stock music, will only be fully understood once audiences can access it. Nonetheless, the established grounding objectives and elements of the music for the film are in place. Foundationally, its electronic and orchestral genres ground the more technical aspects of the various music cues. The curiosity leitmotif use of two major seventh chords, a fourth apart from each other, allows for a sense of brightness and wonder in the scientific discoveries on screen. As well as pairing the curiosity leitmotif with the facts, discoveries, or important conceptual concepts, audience members are given musical clues to things they need to remember to understand the rest of the film. Using single piano notes encourages viewers to look around the screen for new information. The areas of the film purposely without music provide structural elements for *Holy Curiosity's* storyline, creating a gap in music, signaling to audiences that the information is essential for understanding the rest of the film while facilitating the introduction of a new section. The inclusion of instruments with a dynamic, tempo, or time signature change to the score calls attention to an articulated discovery and allows viewers to feel a sense of relief when this musical contrast stops. Lastly, the various keys for each musical cue change the tone of different sequences, such as C Minor to Eb Major, to help reinforce the subjects' emotions on the screen.

The intent of the music is not to create a music bed that "gets audiences through" the film, rather, one that brings audiences into the inner worlds of the characters on screen. The music's technical aspects amplify the intellectual stimulation through auditorial means of music for a greater chance for audience attention and understanding. The deliberate choice to build an

original score into this film had its risks, namely potentially infusing an emotion that doesn't ring true and misdirecting audience attention. By embracing this path, the reward has resulted in a film that aspires to deliver a scientific message rooted in logic that stirs its audience's emotions and captivates its imaginations.

CHAPTER FIVE

THE FUTURE OF DOCUMENTARY FILM MUSIC IS HUMAN

Films like *The Thin Blue Line*, *Particle Fever*, *Koyaanisqatsi*, and *Holy Curiosity* are just a few examples of how various styles of documentaries can benefit from an original film score. Without music, films like *The Thin Blue Line*, *Particle Fever*, and *Koyaanisqatsi* might not have the impact they still have by allowing their music to prompt and guide their audiences toward a set of expected responses (Dickinson 2003).

Moreover, these scores allow audiences to push into a world they may have never been able to encounter the subject on the screen by bridging the emotional gaps of the storyline (Rogers 2013). Not to mention how much the music in these films stimulates influential areas of the brain in audience comprehension (Levitin 2006).

Filmmakers have a host of tools at their disposal to engage audience members. Music is one of the strongest tools to immerse viewers intellectually and emotionally through the various structural and emotive elements it can employ in the use of music fundamentals and technicalities. By investing in a film score, documentary films will increase their audience's attention and understanding by establishing a musical storyline. The facts or discoveries of documentaries will surely fall short if the emotional nuances and sensitivities that are the true key to their meaning and impact are overlooked. Stories and, more significantly, storylines enriched with music are the future of documentaries because they hit at one of the most innate and universal longings of all – what it means to be human.

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