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Synchretic Analysis and Storyboard Scores: the Musical Rhythm of Filmic Elements

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Volume I
Synchretic Analysis and Storyboard Scores: the Musical Rhythm of Filmic Elements

Volume II
The Nightingale: Piece for Orchestra and Narrator
The Twins: Score to the film by Daniela Hoyos
April: Score to the film by Ann Tmangraksat

A dissertation submitted in partial satisfaction of the requirements for the degree of Doctor of Philosophy in Music

by

Jennifer Dirkes

2017
ABSTRACT OF THE DISSERTATION

Volume I
Synchretic Analysis and Storyboard Scores: the Musical Rhythm of Filmic Elements

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by

Jennifer Dirkes
Doctor of Philosophy in Music
University of California, Los Angeles, 2017
Professor David Lefkowitz, Chair

Volume I

What is the relationship between visual action and music? Much film music research explores music’s role in providing emotional subtext, the issues and questions of spotting, and the value of emphasizing hit-points. But what of the ongoing relationship between visual motion (action, editing, physical and camera motions) and music?
According to Michel Chion, the relationship between sound and visuals can create a visual tempo; such “synchresis,” resulting from the alignment or non-alignment of the visual action and musical rhythm, generates added meaning to the film. This paper discusses successive steps in synchretic analysis. Stastical analysis demonstrates the development of relationships over time, while a Storyboard Score reveals the more intimate details of the implicit or explicit synchretic rhythm.

Case studies in this presentation include Bambi (1942), The Lion King (1994), WALL-E (2008), How To Train Your Dragon (2010), and Psycho (1960). The analyses sometimes go far beyond highlighting specific hit-points and/or projecting emotional subtexts to supporting deeper level narratives, and other times suggest differing goals and purposes for the score. In Bambi the music underscores Bambi’s maturing relationship with and understanding of Nature; in WALL-E it defines a robot’s search for love in the form of dance; and in How To Train Your Dragon it highlights the formation of an evolving understanding between two very different creatures; while the analysis of The Lion King reveals that the score demonstrates the isolated journeys of individual characters as opposed to their relationships to one another or to the larger narrative; and in Psycho, the music emphasizes the shift of focus from Marion to Mother/Norman.

Volume II

In conjunction with my research in musico-visual alignment, I wrote three pieces that approach this relationship in different ways: writing music before animation, writing music after animation, and writing music in tandem with story, but without visuals.

The Twins is an animated short by Daniela Hoyos based on a mythology about twin brothers Moonlight and Starlight, who are romantically involved, and the consequences when
Moonlight falls in love with Earth, an anthropomorphic tree. For this score, Hoyos provided an animatic with a set narrative, but without set timing. The score was composed separately from the animatic, but with story and style in mind. I sent the score along with proposed alignment times for each section of the story. Hoyos ultimately timed the action to the music differently, but still matched sequences to musical phrases.

*April* is an animated short by Ann Tmangraksat about a girl who reminisces on a past relationship. Emotions of anger and betrayal are slowly replaced by feelings of bitter sweetness over the course of the two-minute film. The score was composed after the narrative and timings were set, with purposeful musical hit points to align to the set visuals.

*The Nightingale* is a three-act concert work for orchestra and narrator, with text based on the fairytale by Hans Christian Andersen. Although not set to picture, I imagine it could be after the fact, much like Prokofiev’s *Peter and the Wolf*. For now, musical elements represent different facets of the story including setting, characters, and situations. In the first act, metallic percussion sets the scene of the grand porcelain palace. A downward moving melody signals an entering into the dense forest. Pizzicato strings characterize the advisor and court’s walking through the palace and into the forest. Piccolo (the Nightingale), oboe/horn (the Emperor), contrabass, bassoon, oboe/English horn (forest creatures) replace traditional dialogue, while the Narrator filling in the gaps. Act II is sparser in orchestration favoring a chamber ensemble sound as the mechanical bird (celesta) arrives at the palace. In Act III, a Chinese Dagu drum represents Death as the Emperor’s health declines. The instrumentation of the Nightingale extends in the second and third acts, revealing that she offers more than just entertainment; she can sing Death away, she can heal the Emperor’s illness, and she can inform him of the happenings in and around the empire, as his court is untrustworthy and disconnected from the country.
The dissertation of Jennifer Michelle Dirkes is approved.

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University of California, Los Angeles

2017
This work is dedicated to Professor David Lefkowitz, for his mentorship, and to my fiancé Yuan Liu and my parents William and Marifran Dirkes, for their endless love and support.
# TABLE OF CONTENTS

Abstract of the Dissertation ................................................................. ii
Committee Page .................................................................................. v
Dedication ......................................................................................... vi
List of Figures ................................................................................... ix
Acknowledgements ......................................................................... xvi
Vita .................................................................................................... xvii

**VOLUME I**

<table>
<thead>
<tr>
<th>CHAPTER</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Historical Background</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Procedures</td>
<td>11</td>
</tr>
<tr>
<td>3</td>
<td>Bambi</td>
<td>29</td>
</tr>
<tr>
<td>4</td>
<td>The Lion King</td>
<td>56</td>
</tr>
<tr>
<td>5</td>
<td>WALL-E</td>
<td>84</td>
</tr>
<tr>
<td>6</td>
<td>How To Train Your Dragon</td>
<td>114</td>
</tr>
<tr>
<td>7</td>
<td>Psycho</td>
<td>158</td>
</tr>
<tr>
<td>8</td>
<td>Conclusions</td>
<td>175</td>
</tr>
</tbody>
</table>

**BIBLIOGRAPHY** ........................................................................... 180

**VOLUME II**

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>The Nightingale</td>
<td>182</td>
</tr>
<tr>
<td></td>
<td>Program Notes</td>
<td>183</td>
</tr>
<tr>
<td></td>
<td>Instrumentation</td>
<td>184</td>
</tr>
<tr>
<td></td>
<td>Score</td>
<td>185</td>
</tr>
</tbody>
</table>
ACT I ................................................................................................................................................. 185
ACT II ................................................................................................................................................. 200
ACT III ................................................................................................................................................. 205

VOLUME III

The Twins ........................................................................................................................................... 219

VOLUME IV

April ..................................................................................................................................................... 222
LIST OF FIGURES

Fig. 1.1. “Boy skunk and girl skunk in Bambi (1942)” 6
Fig. 1.2. Excerpt of Eisenstein’s diagram for a sequence from Alexander Nevsky 7
Fig. 1.3. The Skeleton Dance, Mickey Mousing 9
Fig. 2.1. Audio spectrogram of “The Murder” from Psycho 12
Fig. 2.2. Beat calculations in “The Murder,” Psycho 13
Fig. 2.3. Example of cataloguing for Psycho 14
Fig. 2.4. Data calculation spreadsheet for “The Murder,” Psycho 16
Fig. 2.5. ATP windows tested in How To Train Your Dragon, “Forbidden Friendship,” mm.18-57 18
Fig. 2.6. Alignment in “Test Drive,” How to Train Your Dragon, quantized at 16th-note level 19
Fig. 2.7. Alignment in “Test Drive,” How to Train Your Dragon, quantized at 8th-note level 20
Fig. 2.8. Alignment in “Test Drive,” How to Train Your Dragon, quantized at quarter-note level 21
Fig. 2.9. Color-coding for storyboard scores 22
Fig. 2.10. Example of color-coding in Bambi: “Winter,” mm.6-9 23
Fig. 2.11. Example of alignment line graph 24
Fig. 2.12. Alignment in “Mufasa’s Ghost,” The Lion King, mm.100-160 25
Fig. 2.13 Character alignment in “Mufasa’s Ghost,” The Lion King, mm.100-160 26
Fig. 3.1a. Alignment throughout “Little April Shower,” mm.1-88 32
Fig. 3.1b. Alignment throughout “Little April Shower,” mm.89-163
Fig. 3.2. Storyboard score for “Little April Shower,” mm.1-3
Fig. 3.3. Storyboard score for “Little April Shower,” mm.23-26
Fig. 3.4. Storyboard score for “Little April Shower,” mm.70-71
Fig. 3.5. Storyboard score for “Little April Shower,” mm.90-91
Fig. 3.6. Storyboard score for “Little April Shower,” mm.128-131
Fig. 3.7a. Storyboard score for “Little April Shower,” mm.140-143
Fig. 3.7b. Storyboard score for “Little April Shower,” mm.144-147
Fig. 3.8a. Storyboard score for “Little April Shower,” mm.160-161
Fig. 3.8b. Storyboard score for “Little April Shower,” mm.162-163
Fig. 3.9. Alignment/Tension throughout “Winter”, mm.1-41
Fig. 3.10. Storyboard score for “Winter,” mm.1-5
Fig. 3.11. Storyboard score for “Winter,” mm.18-20; Man’s motive
Fig. 3.12. Storyboard score for “Winter,” mm.21-23
Fig. 3.13a. Storyboard score for “Winter,” m.33
Fig. 3.13b. Storyboard score for “Winter,” mm.34-37
Fig. 3.14a. Storyboard score for “Winter,” mm.44-47
Fig. 3.14b. Storyboard score for “Winter,” mm.48-52
Fig. 3.15a. Storyboard score for “Winter,” mm.70-71
Fig. 3.15b. Storyboard score for “Winter,” mm.72-73
Fig. 3.15c. Storyboard score for “Winter,” mm.74-77
Fig. 3.16a. Storyboard score for “Winter,” mm.78-80
Fig. 3.16b. Storyboard score for “Winter,” 81-83
Fig. 4.1. Alignment throughout “Father’s Footsteps” 58
Fig. 4.2. Storyboard score for “Father’s Footsteps,” mm.6-7 59
Fig. 4.3. Storyboard score for “Father’s Footsteps,” m. 26 60
Fig. 4.4. Storyboard score for “Father’s Footsteps,” mm.39-42 61
Fig. 4.5. Simba’s alignment throughout “Father’s Footsteps” 62
Fig. 4.6. Storyboard score for “Father’s Footsteps,” m. 22 63
Fig. 4.7. Storyboard score for “Father’s Footsteps,” m. 33 64
Fig. 4.8. Mufasa’s alignment throughout “Father’s Footsteps” 65
Fig. 4.9. Storyboard score for “Father’s Footsteps,” m.18 66
Fig. 4.10. Character alignment throughout “Father’s Footsteps” 67
Fig. 4.11a. Alignment in “Mufasa’s Ghost,” mm.32-116 69
Fig. 4.11b. Alignment in “Mufasa’s Ghost,” mm.117-160 70
Fig. 4.12a. Character alignment throughout “Mufasa’s Ghost,” mm.32-99 71
Fig. 4.12b. Character alignment throughout “Mufasa’s Ghost,” mm.100-161 72
Fig. 4.13. Storyboard score for “Mufasa’s Ghost,” m.113 73
Fig. 4.14. Storyboard score for “Mufasa’s Ghost,” m.132 74
Fig. 4.15. Storyboard score for “Mufasa’s Ghost,” m.139 75
Fig. 4.16. Storyboard score for “Mufasa’s Ghost,” mm.41-42 76
Fig. 4.17. Storyboard score for “Mufasa’s Ghost,” mm.102-104 77
Fig. 4.18. Storyboard score for “Mufasa’s Ghost,” m.112 78
Fig. 4.19. Storyboard score for “Mufasa’s Ghost,” mm.114-115 79
Fig. 4.20a. Storyboard score for “Mufasa’s Ghost,” m.133 80
Fig. 4.20b. Storyboard score for “Mufasa’s Ghost,” m.134 81
Fig. 4.20c. Storyboard score for “Mufasa’s Ghost,” m.135

Fig. 5.1. Alignment throughout “Work Day”

Fig. 5.2. Storyboard score for “Work Day,” mm. 1-2

Fig. 5.3. Storyboard score for “Work Day,” mm. 6-7

Fig. 5.4a. Storyboard score for “Work Day,” mm. 8-9

Fig. 5.4b. Storyboard score for “Work Day,” mm. 10-12

Fig. 5.5a. Storyboard score for “Work Day,” mm. 29-31

Fig. 5.5b. Storyboard score for “Work Day,” m. 32

Fig. 5.6a. Storyboard score for “Work Day,” mm. 45-46

Fig. 5.6b. Storyboard score for “Work Day,” m. 47

Fig. 5.6c. Storyboard score for “Work Day,” m. 49

Fig. 5.6d. Storyboard score for “Work Day,” m. 50

Fig. 5.7a. Storyboard score for “Work Day,” m. 58

Fig. 5.7b. Storyboard score for “Work Day,” m. 59

Fig. 5.7c. Storyboard score for “Work Day,” m. 60

Fig. 5.7d. Storyboard score for “Work Day,” m. 61

Fig. 5.7e. Storyboard score for “Work Day,” mm. 62-63

Fig. 5.7f. Storyboard score for “Work Day,” mm. 64-67

Fig. 5.8. Alignment throughout “Define Dancing”

Fig. 5.9. Storyboard score for “Define Dancing,” m.5

Fig. 5.10. Storyboard score for “Define Dancing,” mm.26-27

Fig. 5.11a. Storyboard score for “Define Dancing,” mm. 49-53

Fig. 5.11b. Storyboard score for “Define Dancing,” m.54
Fig. 5.12. Storyboard score for “Define Dancing,” mm. 64-65
Fig. 5.13a. Storyboard score for “Define Dancing,” m. 72
Fig. 5.13b. Storyboard score for “Define Dancing,” mm.73-75
Fig. 6.1a. Alignment throughout “Forbidden Friendship,” mm.1-67
Fig. 6.1b. Alignment throughout “Forbidden Friendship,” mm.68-133
Fig. 6.2. Storyboard score for “Forbidden Friendship,” mm.16-19
Fig. 6.3. Storyboard score for “Forbidden Friendship,” mm.28-29
Fig. 6.4a. Storyboard score for “Forbidden Friendship,” mm.37-38
Fig. 6.4b. Storyboard score for “Forbidden Friendship,” mm.39-41
Fig. 6.4c. Storyboard score for “Forbidden Friendship,” m.42
Fig. 6.4d. Storyboard score for “Forbidden Friendship,” m.43
Fig. 6.4e. Storyboard score for “Forbidden Friendship,” mm.44-45
Fig. 6.4f. Storyboard score for “Forbidden Friendship,” m.46
Fig. 6.4g. Storyboard score for “Forbidden Friendship,” m.47
Fig. 6.4h. Storyboard score for “Forbidden Friendship,” m.48-49
Fig. 6.5a. Storyboard score for “Forbidden Friendship,” m.62
Fig. 6.5b. Storyboard score for “Forbidden Friendship,” mm.63-65
Fig. 6.5c. Storyboard score for “Forbidden Friendship,” mm.66-67
Fig. 6.6a. Storyboard score for “Forbidden Friendship,” mm.73-74
Fig. 6.6b. Storyboard score for “Forbidden Friendship,” m.75
Fig. 6.7 Storyboard score for “Forbidden Friendship,” mm.81-82
Fig. 6.8 Storyboard score for “Forbidden Friendship,” mm.96-97
Fig. 6.9a. Storyboard score for “Forbidden Friendship,” mm.105-106
Fig. 6.9b. Storyboard score for “Forbidden Friendship,” mm.107-108

Fig. 6.9c. Storyboard score for “Forbidden Friendship,” mm.109-111

Fig. 6.9d. Storyboard score for “Forbidden Friendship,” mm.112-114

Fig. 6.10. Storyboard score for “Forbidden Friendship,” m.120-122

Fig. 6.11. Storyboard score “Forbidden Friendship,” mm.126-128

Fig. 6.12. Storyboard score for “Forbidden Friendship,” mm.130-131

Fig. 6.13. Alignment throughout “Test Drive”

Fig. 6.14a. Storyboard score for “Test Drive,” m.22

Fig. 6.14b. Storyboard score for “Test Drive,” m.23

Fig. 6.14c. Storyboard score for “Test Drive,” m.24

Fig. 6.14d. Storyboard score for “Test Drive,” m.25-26

Fig. 6.14e. Storyboard score for “Test Drive,” m.27

Fig. 6.14f. Storyboard score for “Test Drive,” m.28

Fig. 6.14g. Storyboard score for “Test Drive,” m.29

Fig. 6.15a. Storyboard score for “Test Drive,” m.42

Fig. 6.15b. Storyboard score for “Test Drive,” m.43

Fig. 6.16. Storyboard score for “Test Drive,” m.53

Fig. 6.17 Storyboard score for “Test Drive,” m.65

Fig. 6.18 Storyboard score for “Test Drive,” m.69

Fig. 7.1. Alignment throughout “The Peephole”

Fig. 7.2a. Storyboard score for “The Peephole,” mm.15-16

Fig. 7.2b. Storyboard score for “The Peephole,” mm.17-18

Fig. 7.2c. Storyboard score for “The Peephole,” mm.19-22
Fig. 7.3. Storyboard score for “The Peephole,” mm.25-26

Fig. 7.4. Storyboard score for “The Peephole,” mm.31-32

Fig. 7.5a. Storyboard score for “The Peephole,” m.37

Fig. 7.5b. Storyboard score for “The Peephole,” mm. 39-41

Fig. 7.7. Alignment throughout “The Murder”

Fig. 7.8. Storyboard score for “The Murder,” mm.15-18

Fig. 7.9. Storyboard score for “The Murder,” mm.20-25

Fig. 7.10a. Storyboard score for “The Murder,” mm.26-31

Fig. 7.10b. Storyboard score for “The Murder,” mm.32-37
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CHAPTER 1: HISTORICAL BACKGROUND

1.1 OVERVIEW

More than simply reinforcing an existing meaning presented in the narrative of the film, music and film work collaboratively to produce new meaning. By analyzing both visuals and music separately and jointly, a greater understanding of music’s function in film is more readily apparent.

Heretofore, scholarship on music in film has tended to fall into three categories: historical development of scores, psychology and the audience’s perception of music in film, and how the music serves the emotional subtext of the movie. Much of this research revolves around the third of these categories: a phenomenological discussion of music’s power to emote, inform, describe, guide, and manipulate the perception of time. Music’s effect on emotions has been

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4 It should be noted that music provides one level of subtext amongst other elements (the screenplay, for example, will also include subtext).


6 This list is drawn from Johnny Wingstedt, Sture Brändström and Jan Berg, “Narrative Music, Visuals, and Meaning in Film,” *Visual Communication* 9, no. 2 (2010), 194-195.
studied at length: according to an empirical study conducted by Coutinho and Dibben, music elicits stronger emotional responses than speech by 200%. Potentially more powerfully than dialogue, music thus amplifies the intensity of a film scene.

This dissertation proposes a fourth category of film music scholarship: analyzing the moment-to-moment interconnectedness between music and film—that is, visual-musical synchronization. This is less about how the score evokes responses from audiences than the effect that the alignment or the lack of alignment of on-screen action and musical meter and other sonic events has on our apperception of the work. This is accomplished through a frame-by-frame analysis of the timing of the visual action as related to the timing—the rhythm—of the music.

Dušan Stojanović proposes that rhythm in film is based on dominants: whatever is most prominent in a given sequence, including shapes, lines, colors, and sounds. Dominants of movement involve picture and sound. Dominants of space-time include all visual, auditory, temporal, and psychological elements of film that influence our perception of time. The perception of time—what I may refer to as film rhythm—may be affected by either editing or movement with a shot. Danijela Kulezic-Wilson argues for an integrated definition that includes both movement and space-time. She offers “macro-rhythm” as a conceptual framework for film rhythm: a gradually-unfolding (“delayed,” in Kulezic-Wilson’s terminology) set of rhythmic relationships between elements within a larger form.

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7 Coutinho and Dibben, “Psychoacoustic cues,” 680.

8 Kulezic-Wilson, Musicality of Narrative Film, 43.

9 Kulezic-Wilson, Musicality of Narrative Film, 53
Michel Chion argues that the combination of film and *sound* creates a more encompassing sense of time: the “audio-visual phrasing.”10 Chion speaks of “‘visualists’ of the ear and ‘auditives’ of the eye,” creating a “transsensorial perception.”11 Thus sounds may affect our spatial perception, and visuals may affect our auditory perception.

Chion describes the intimate relationship between music and film as an “audio-visual contract”; audio and visuals are perceived differently but they mutually support each other. Musical value is qualified as empathetic (congruent) or anempathetic (incongruent) with the tone of the visual drama. Furthermore, sound can imply a tempo to or even impose a tempo on the visuals, generating added meaning. Chion calls this “synchresis” and supports the idea with research that shows that changing the music accompanying a single video clip can alter the perceived meaning, regardless of what the visuals portray.12 Thus, *the way music synchronizes with the picture will impact the emotional scope of the dramatic scenario*.

After Chion, my approach takes as a starting point a *masked analysis* of both sound and images: I prepare a reduced (simplified and condensed) score of the music, noting the metrical positioning of any diegetic sounds.13 I then prepare a basic storyboard-based analysis of the relevant portion of film, highlighting those frames in which there are significant moments (“dominants,” after Stokanović) of on-screen action. Such “significant moments” are typically the beginnings or endings of specific movements, the appearance or disappearance of significant

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13 In *Bambi*, there are no diegetic sounds, except for bird sounds, the gunshots in the “Winter” scene, snow falling, water splashing and dialogue.
objects or characters, or editing cuts. I then prepare an *unmasked analysis*, aligning those
significant moments of on-screen action with their precise metrical position in the musical score;
I create an additional musical staff on which we notate the *rhythm* of the visuals: on-screen
moments that align metrically are connected with lines to the stems of the rhythms in that visual-
rhythm staff, while moments that do not align are shown appearing between given metrical
positions.

The question that this masked-then-unmasked analysis begins to answer is: how does the
alignment (or, following Chion, *synchronization*) of the music and the visuals relate to the
narrative—the diegesis? Does it create a *rhythmic diegesis*—Chion’s “audiovisual phrasing”—
separate and distinct from the more surface-level plot-line, or one that is directly supportive of
(or contradictory to) it? Or does that rhythmic diegesis convey or help support a deeper plot-
line—one that we can describe as the deeper “subject” of the film? Does it emphasize individual
moments, or the overall flow of a scene? By asking “what is that rhythmic diegesis?”,
*interpretative analysis* thus proceeds from the *rhythmic analysis*.

Note that in this masked-then-unmasked analysis, I have said nothing about the quality of
the sounds themselves—be they objective features (*a dominant seventh; an atonal cluster*) or
subjective (*a maudlin melody; a tense low-register pedal tone*)—nor about the images. These
features (the second and third category of film music analysis referred to earlier) can be added to
the analysis once we have achieved an understanding of the alignment of the music and the
visuals: those objective and subjective features may gain (or lose) significance depending upon
the patterns of musico-visual alignment that lead up to and follow any given moment.

Using this approach (following a brief overview of the history of Disney films—the first
category described earlier), I examine scenes from Disney’s *Bambi* (1942), *The Lion King*
(1994), WALL-E (2008), Dreamworks’ How To Train Your Dragon (2010), and Alfred Hitchcock’s Psycho (1960). Through careful analysis, I have determined that the rhythmic diegesis supports specific interpretations of the films’ overall narrative content. This deep-level narrative content is not obvious without such an analytic approach.

1.2 STORYBOARDS

The process of animation begins with storyboards, a sequence of drawings that depict the general movement and dialogue for a scene. For example, the storyboard for “Boy skunk meets girl skunk in Bambi” shows Flower falling in shock after seeing the beautiful girl skunk. This action and emotion are clear from the first two drawings: Flower is petrified, falling head over-heels in board 73, and lands on his stomach in 74 (Figure 1).\(^\text{14}\) Although it does not show every frame that will create the moving picture, it still conveys enough of the action, reactions, and view changes to convey the essence of the sequence. The drawings are often tacked to corkboards to allow animators to add, remove, and replace drawings as the story takes shape. This process helps in drafting and revising the story, characters, and dialogue in a clear and organized manner. Walt Disney invented the use of storyboards, which “is today a worldwide standard procedure for the production of both animation and live-action films and videos.”\(^\text{15}\)


\(^{15}\) Canemaker, ix.
1.3 SYNCHRONIZATION OF SOUND AND FILM

Russian filmmaker Sergei Eisenstein was the first to attempt to chart visual and musical pacing, in his preparations for *Alexander Nevsky* (1938). His system of matching film edits to Prokofiev’s musical phrasings has origins in Disney’s storyboard process, which he witnessed at the studio in 1930. He adapted this process later in *Ivan the Terrible* (1944) (Figure 1.2). Within the first decade and a half of the development of synchronized sound, therefore, we can see a conscious effort by directors and composers not only to match dramatic and musical *pacing* but dramatic and musical *rhythm*.

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Disney placed great emphasis on the score as an integral part of his storytelling. After the advent of synchronized sound in the late 1920s, Walt Disney quickly incorporated the technology into his cartoons, beginning with Steamboat Willie (1928). He went on to produce Fantasia (1940), which he intended to be the first of a series to introduce the audience to classical music. Animators created animation to match the music in Fantasia, a process that differs from both the current norm of scoring to a final cut of a live-action film, and from a more recent approach in animated film, which relies on songs to create and tell the story while the score fills in the gaps after the visual is complete.

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18 Eisenstein, The Film Sense, 289.

A composer may be consulted to aid in the storyboard process. In the case of “Little April Shower” (from Bambi), animators called in composer Frank Churchill to play “raindrop music” to help them capture the feeling of the scene as they sketched the scene. Thus, music can inform animation and vice versa.

1.4 CREATION OF MUSIC BEFORE OR AFTER FINAL ANIMATION

In films ranging from Snow White and the Seven Dwarfs (1937) to Frozen (2013), The Walt Disney Studios generally employed a system whereby composers write all of the songs before animation (as with Fantasia and similar to Eisenstein’s Alexander Nevsky) but complete the scoring after animation. The creation of songs (music sung by characters on- or off-screen that the animators will use for timing reference when creating the visuals for a film), occurs before and alongside the creation of the story, as they are often an integral part of the storytelling. By comparison, the score, instrumental music composed to accompany the picture, follows the animation to reflect and support the timing, pacing, and emotional content of the action.

1.5 CLICK TRACKS AND MICKEY-MOUSING

Disney paid careful attention to the dramatic impact of marrying sound and action. To achieve synchronization, composer Carl Stalling, employed by Disney for several cartoon shorts between 1929 and 1935, created the “click track.” Click tracks channel tempos, as beat clicks,

20 Bambi: Bonus Material. (2005; Burbank, CA: Walt Disney Studios Home Entertainment), DVD.

21 Carl Stalling scored Plane Crazy (1928), Gallopin’ Gaucho (1928), The Skeleton Dance (1929), and roughly fifteen other shorts for Disney until his departure from the studio in
to musicians through headphones so that each musical attack occurs at precisely the right moment. This marriage of sound and action led to the development of a film-music style that composers sometimes call “Mickey Mousing,” such as a xylophone attack to accent blinking eyes of disbelief. These types of musical associations went as far as to replace sound effects in some instances. In the 1929 Disney “Silly Symphony” *The Skeleton Dance*—Stalling’s first attempt at click-track synchronization—for instance, a wood block is heard every time the skeleton clicks his teeth together (Figure 1.3). The wood block serves the purpose of sound effect in absence of a separately recorded sound. In this way, the score served actively as an essential part of the story, taking on or supplementing the role of narrator.

![Figure 1.3: The Skeleton Dance, Mickey Mousing](image)

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22 *The Skeleton Dance*, dir. by Walt Disney (1929; Columbia Pictures, DVD).
1.6 SPOTTING THE MUSIC

“Spotting the music”—deciding when the music enters and exits within a film—“aside from the actual composing of the score, is probably the most critical aspect in the process of providing music for motion pictures.”23 In most cases the score should be felt and not heard, requiring very careful attention on the part of the composer and director to when and how a cue enters a scene. Moreover, the music should not interfere with the dialogue or conflict with the action onscreen. The relationship between music and film is “a symbiotic catalytic exchange,” in which the two depend on one another.24 This notion, conflicting with the older style of Mickey Mousing, describes current general trends in film music.

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24 Prendergast, *Film Music*, 217.
CHAPTER 2: PROCEDURES

Building on Chion’s concept of synchresis, I developed a system to analyze the rhythmic relationship between score and film, employing the storyboard score, a musical-visual diagram that incorporates musical notation and still frames. In sum, it can be described as synchretic analysis, the exploration of musical-visual rhythmic interaction and its impact on the narrative, both superficial and at a deeper background level. The analysis is a multi-step process falling under four main stages: 1) Transcription, 2) Data Analysis, 3) Storyboard Score Creation, and 4) Interpretation.

STAGE 1: TRANSCRIPTION AND REDUCTION

In the first step of Stage 1, the music is transcribed using notation software (such as Sibelius or Finale), and reduced onto two to four staves. This process is facilitated with the use of a score (ideally procured from the composer or studio archive); since film music is often altered both on the fly in recording sessions and subsequently in the editing process, however, even a composer’s original score may serve only as a guide and not as a definitive representation of the music actually heard on the film.

In the second step of Stage 1, the audio is then imported into digital audio software (such as Adobe Audition) that allows the analyst to collect precise timings for each measure and for the beats within each measure. An audio spectrogram provides more detailed information about pitch for more accurate identification of beat timings down to the thousandths of a second (Figure 2.1).
Figure 2.1: Audio spectrogram of “The Murder” from Psycho

Stronger signals (more yellow in color, in Figure 2.1) correspond to louder sounds; vertical position conveys frequency. The spectrogram is invaluable in that downbeats can be identified more easily by searching for a signal at the corresponding frequency, even if muddled by dialogue and sound effects. Accuracy of the analysis of the precise timing of musical events is confirmed through further calculations performed in an Excel spreadsheet (Figure 2.2; downbeat times in gray). Markers within the audio spectrogram file help keep track of downbeats in the event that later calculations need to be reevaluated. Subdivisions beyond the measure are calculated by dividing the difference between two downbeats; for example, in Figure 2.2, the difference between G8 (the precise time of beat 1 of measure 2) and G2 (the precise time of beat 1 of measure 1) is shown in H3, which can then be divided by 6 to yield the time value of each
quarter in 3/2 time signature (shown in H5). The intervening beats are then calculated by Excel. The tempo is then calculated: \( \frac{60}{(H5 \times 2)} \) = half-note beats per minute in m.1. Similar calculations for subsequent measures will test the consistency of tempo; great inconsistencies may call precision of the measurements into question.

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<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
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<td>MM</td>
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<td>18.875</td>
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Figure 2.2: Beat calculations in “The Murder,” *Psycho*

These careful calculations are essential to the process, as post-recording editing is commonplace in filmmaking. Music editors often add and delete beats and measures in order to fit film editing changes subsequent to the recording of the music.\(^{23}\) A drastic change in tempo according to the spreadsheet calculations that does not exist in the score typically signals these kinds of edits.

The third step of Stage 1 involves cataloging filmic elements: dialogue, sound effects, editing, and visual action (Figure 2.3). Each character movement, point of view change, camera

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\(^{23}\) It is important to note that these changes are generally omitted from the soundtrack. An
movement, and spoken syllable\(^ {24}\) is catalogued with a corresponding timecode to document the rhythm of filmic elements. This is accomplished by scrubbing through video and audio frame by frame.

<table>
<thead>
<tr>
<th>FRAME</th>
<th>ACTION</th>
<th>EDITING</th>
<th>SOUND</th>
</tr>
</thead>
<tbody>
<tr>
<td>00:43:09:11</td>
<td></td>
<td></td>
<td>Marion: &quot;Good-&quot;</td>
</tr>
<tr>
<td>00:43:10:01</td>
<td>Marion moves</td>
<td>&quot;night.&quot;</td>
<td></td>
</tr>
<tr>
<td>00:43:10:26</td>
<td>Camera pans right</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00:43:11:19</td>
<td>Bows head</td>
<td>Marion o/s</td>
<td></td>
</tr>
<tr>
<td>00:43:12:12</td>
<td>Norman moves</td>
<td>Norman stands</td>
<td></td>
</tr>
<tr>
<td>00:43:15:18</td>
<td>Norman stands</td>
<td>Norman stops</td>
<td></td>
</tr>
<tr>
<td>00:43:17:00</td>
<td>POV change</td>
<td>Marion step</td>
<td></td>
</tr>
<tr>
<td>00:43:17:04</td>
<td>Step</td>
<td>Step</td>
<td></td>
</tr>
<tr>
<td>00:43:17:18</td>
<td>Step</td>
<td>Stephen</td>
<td></td>
</tr>
<tr>
<td>00:43:18:09</td>
<td>Marion o/s</td>
<td>Shadow on support beam</td>
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</tr>
<tr>
<td>00:43:19:00</td>
<td>Step</td>
<td>Marion stop</td>
<td></td>
</tr>
<tr>
<td>00:43:19:08</td>
<td>POV change</td>
<td>Step</td>
<td></td>
</tr>
<tr>
<td>00:43:20:01</td>
<td>Door opens</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00:43:20:17</td>
<td>Places mint on tongue</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00:43:21:07</td>
<td>Arm down</td>
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<td></td>
</tr>
<tr>
<td>00:43:21:09</td>
<td>Mouth closed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00:43:21:19</td>
<td>Step</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00:43:21:21</td>
<td>Door closes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00:43:22:23</td>
<td>Places hands on ledge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00:43:23:12</td>
<td>TURNS head</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00:43:23:21</td>
<td>Stop turning</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 2.3: Example of cataloguing for Psycho

**STAGE 2: DATA ANALYSIS**

Once the transcriptions are complete, alignment between music and film is calculated in a spreadsheet (Figure 2.4). The procedures for doing so in Excel are described in the box below (for those who are interested in such details). The percentage of alignment between musical

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\(^ {24}\) Fragments of lines were catalogued for *Bambi* and *WALL-E*, while syllables were catalogued for *The Lion King*, *How To Train Your Dragon*, and *Psycho*. I initially believed that the rhythm of speech was an unimportant aspect, having been pre-recorded in a studio and with minimal room for later editing. Regardless of the intent for rhythm and pacing in recorded dialogue, I now believe each sub-unit (syllable) to be influential in the perception of film rhythm both visual and aural.
rhythm and action events per measure is then charted in a line graph; moving averages can help clarify the longer-term trends of these alignment percentages.\textsuperscript{25} The alignment graph portrays the overall trajectory of the scene.

Beat times and timecodes are converted into seconds (to the thousandth) for ease of calculation (columns B and C in Figure 2.3). They are compared to each other in two ways: column D index matches the music time in column B to the nearest action time in column C without exceeding the value in column C. To accommodate values that exceed the value in column C, the opposite formula is performed; column E index matches the action time to the music time, stated in the values of the Measure Beat Quarter (M.B.Q., column A) position. To find the closest match for each event, each match is subtracted from the searched value in columns F and G. In columns H and I, the matches are compared to the Audiovisual Temporal Perception (ATP) window. The ATP window generally falls between 120ms before and 125ms after visual stimuli; it will be discussed in greater depth subsequently.\textsuperscript{26} For various reasons, 45ms before and 90ms after are used in data for How To Train Your Dragon and Psycho. To prevent duplicates for an event (in the case that both AT-MT and MT-AT fall within the ATP window), the results are simplified in column J.

\textsuperscript{25} Measures are used as a unit of demarcation for clarity in alignment graphs. Segmenting graphs by the measure in cues that last roughly 100 measures is clearer than, for example, segmenting by the beat, which would yield as many as four hundred or more nodes. One could segment by seconds of video, but there is no standard system to delineate “measures” of video as uniformly as musical measures. This is a possible point for future research and work in both film analysis and synchretic analysis.

\textsuperscript{26} Argiro Vatakis and Charles Spence, “Audiovisual synchrony perception for music, speech, and object actions,” Brain Research 1111, no. 1 (September 2006): 134-142.
For people with normal hearing and vision, asynchrony between visuals and speech, when visual stimuli occur before auditory stimuli, with a temporal difference of as little as 45 milliseconds, and as great as 125 milliseconds when auditory stimuli occur before visual stimuli.\(^{27}\) Recent research by Argiro Vatakis and Charles Spence suggests that this window is much greater when the auditory stimuli are musical, allowing 125 milliseconds either way to perceive synchrony.\(^{26}\) However, their sample was relatively small (21 participants), all within 19-33 years of age, and none had any musical training.\(^{29}\)

\(^{27}\) Vatakis and Spence, “Audiovisual synchrony perception,” 40.

\(^{28}\) Vatakis and Spence, “Audiovisual synchrony perception,” 43.
Hweeling Lee and Uta Noppeney created an experiment to test a longer duration (musical melody) as opposed to single notes and found that musicians have a narrower window of audiovisual perception than non-musicians, with less than 20% reporting synchrony within a 180-millisecond window on either side. Non-musicians generally identified a piano melody (audio) as synchronous with video (hands playing the piano) with auditory stimuli leading by 135 milliseconds and visual stimuli leading by 90 milliseconds. Most of the tested musicians also reported synchrony when auditory stimuli led by 135 milliseconds, but visual stimuli only leading by 45 milliseconds.30

Following Lee and Noppeney, the calculations performed for this research the window when visual stimuli preceeded auditory stimuli employed a value fixed at 45 ms. The window for when auditory stimuli preceed visual stimuli, however, has been reduced from the 125-135 ms described in the psychological research to 90 ms (the green line in Figure 2.5). Using a larger window yielded what seemed to be inflated and uninteresting or uninformative graphs — with consistently high alignment, and few or no peaks or troughs (the red line in Figure 2.5). Narrowing the window beyond this 45/90 size, however, yielded what seemed to be inaccurately deflated and similarly uninteresting or uninformative graphs — with consistently low alignment, and few or no peaks or troughs (the blue line in Figure 2.5).


QUANTIZATION

In addition to the audiovisual perception window, musical quantization is also an essential consideration when comparing to visual elements. Quantization involves the alignment of events to a musical grid according to a pre-selected subdivision. A smaller quantization denomination — such as sixteenth-notes in a fast tempo — yields higher alignment overall; too small of a quantization, however, can inflate trend lines and obscure the analysis. Too large of a quantization — such as quarter notes in a slow tempo — results in a flatter, lower, trend line. Quantizing at a fourth of the duration associated with the beat is generally appropriate. Most of
the music examined in this monograph has a time signature with a quarter-note beat, thus the quantization level (divide by four) is at the sixteenth. This follows common subdivision practices in music performance. But fast tempos require a reconsideration of this guideline in order to avoid the aforementioned trend line inflation. For example, *How To Train Your Dragon*’s “Test Drive” has a 4/4 time signature and tempos ranging between 111 and 117 beats per minute.

When examined with a quantization at the sixteenth note, the resulting graph produces uninteresting results with alignment hovering around 80% and higher (Figure 2.6). This fast tempo then requires a larger quantization at the 8\(^{th}\)-note (Figure 2.7). The adjusted window of quantization generates a more dynamic graph that is more suitable for analysis. For comparison, Figure 2.8 shows quantization at the quarter-note for this passage.

![Graph](image)

Figure 2.6: Alignment in “Test Drive,” *How to Train Your Dragon*, quantized at 16\(^{th}\)-note level
Figure 2.7: Alignment in “Test Drive,” *How to Train Your Dragon*, quantized at 8th-note level
STAGE 3: STORYBOARD SCORES

The method used to analyze the temporal function of film music I term the “storyboard score.” Somewhat akin to Sadoff’s “Musical and Visual Syntax” graphs, the storyboard score gives equal representation to the animation and music, with categorized rows of frames placed chronologically in line with a reduced score. Precisely aligning individual frames with the meter of the music enhances Sadoff’s system and allows for an informed analysis of musical-visual pacing.

The categorized rows separate events into 1) Dialogue and Sound, 2) Editing (cuts, fades, frame entrances and exits, etc.), and 3) Action. Returning to the notation software, I create an additional stave at the top of the music with the rhythm of the films elements including dialogue, sound effects, editing, and action. Note-stems in the top staff (the “action line”) of the reduced score are linked directly to the storyboard frames when they align. Color-coded rectangles classify the relationship between music and film: *green* for important on-screen moments that line up with musical moments; *red* for important on-screen moments that do *not* line up with a musical moment; *purple* for less important on-screen moments that line up with important musical moments; and *blue* for on-screen moments continuing the meter of the otherwise-absent music. Frames without colored boxes contain actions that are less notable and do not align with the music (Figures 2.9 and 2.10).

**KEY**

- **Important on-screen moment lines up with musical moment**
  - Green

- **Important on-screen moment DOES NOT line up with musical moment**
  - Red

- **Less important on-screen moment lines up with important musical moment**
  - Purple

- **On-screen moment serving the otherwise-absent musical purpose**
  - Blue

Figure 2.9: Color-coding for storyboard scores
Calculations completed in the spreadsheet provide information about which frames occur in which measures. In video editing software (such as Adobe Premiere Pro), individual frames are stamped with timecode and exported as images. They are then imported into the vector-imaging program with a PDF version of the score. Stems are then extended to connect aligned frames to the corresponding rhythm. Unaligned frames are connected to lines that point to their temporal position in relationship to the score. Colored boxes are then added to frames to clarify the importance of alignment and misalignment.

Figure 2.10: Example of color-coding in *Bambi*: “Winter,” mm.6-9
STAGE 4: INTERPRETATION

Data is evaluated in a variety of ways. The rise and fall of alignment throughout a given scene is shown in line graphs. Narrower and broader moving averages help clarify the long-term trends (Figure 2.11). Peaks and valleys highlight moments of interest in the synchronization between music and visuals, which can then be studied for their narrative content in the storyboard scores.

Figure 2.11: Example of alignment line graphs

While alignment line graphs yielded interesting insights for almost all of the films analyzed here, in the case of The Lion King, raw data and moving averages yielded uninteresting graphs that hover around 50% alignment (Figure 2.12). For this reason, the data was analyzed by character: alignment of character actions (with the non-character based film editing action omitted). Each character’s alignment was then charted together for a more dynamic graph (Figure 2.13). For The Lion King, this proved more successful in showing Simba’s evolution
from young cub to disillusioned exile to hero of the pride. (As we will see, the actions of Rafiki and Mufasa are less important as they *know* their place in the circle of life.)

Figure 2.12: Alignment in “Mufasa’s Ghost,” *The Lion King*, mm.100-160
While alignment graphs show trends clearly and help highlight moments of high or low alignment, storyboard scores show more detail in how the data aligns in shorter passages. For example, it may reveal saturation of blue boxes (action aligns to unimportant musical moment or continues the meter in a moment of rest) boxes. The action staff in the score, furthermore, sheds light on rhythmic patterns in the visual pacing, and may also reveal the precise rhythm of the alignment, information that is not found whatsoever in the alignment graphs (see discussion of dance rhythm in Chapter 5, for instance).

Lastly, the storyboard scores enable the analyst to take into account significant “hit points,” regardless of how those hit points relate to overall alignment trajectories. Important
moments in the film may not be reflected as dynamically in the alignment graphs if synchrony is unexceptional for the measure. For example, in *How to Train Your Dragon*, alignment hits a mid range (70%) at the end of “Forbidden Friendship” when Hiccup attempts to touch Toothless. But the storyboard score reveals alignment at the pivotal moment when Toothless pushes his head towards Hiccup’s hand and the two engage in physical contact.

No single system of interpretation works for any film, but the aforementioned procedures are malleable to suit each situation. Alignment graph trajectories give an initial overview of synchrony throughout a scene. Peaks and troughs serve as guideposts to locate notable moments of alignment to be examined in the storyboard score. Character actions can be graphed separately to illuminate the evolution of individuals throughout a scene. In storyboard scores, the rhythm of alignment potentially reveals underlying themes in a scene or film. Notable hit points identified in storyboard scores complement information provided by the alignment graphs. These methods can be implemented in tandem or separately to analyze the latent, but unique relationship between musical-visual rhythmic alignment and its impact on the narrative.

FRAME RATES AND MATH PROBLEMS

For the dissertation I used video from personal DVD copies of most of the films analyzed. For some films this presents a problem, as the DVD format is a remastered version of the original frame rate. This could potentially alter some results, especially for *Bambi* (1942) and *Psycho* (1960)[32] because of the multiple restorations since their release. *WALL-E* was also extracted from an original release DVD copy at 29.97 fps, although the film itself was initially

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32 *Bambi* and *Psycho* were created at 24 fps, while the DVD copies run at 29.97 fps. Trying to reconstruct the original is impossible, because of the multiple restorations over the years.
released in theaters at 24 fps. (Blu-Ray copies were used for *The Lion King* and *How To Train Your Dragon*, which preserve the original frame rate.)

Another problem arose between Adobe Premiere’s quantification of frames: the DVDs have a 29.97 frame rate, but the software counts it as 30 full frames. It uses the “drop frame timecode” method, wherein the audio and video get to be a full frame out of sync. At this point, two frames are added to the timecode to adjust for the difference (thus the intervening frame is “dropped.”)\(^{33}\) The difference in duration between frame 29 and 30 is negligible, but over the course of a minute, the discrepancy between the time code number (as displayed in Adobe Premiere) and real time number (as displayed in Adobe Audition) is 0.06 seconds. And with most of the scenes occurring more than twenty minutes into the film, the difference is greater than 1.2 seconds, about ten times larger than the 125 ms window previously discussed. The issue arose in the audio timing stage, as Adobe Audition counts audio by the thousandths of the second. Post-data-collection calculations were required to accommodate for the difference.

Where the timecode is HH:MM:SS:FF, the total duration of the film is converted into minutes [\(TD = (60 \times HH) + MM\)]. There are multiple steps to then find the frame number from a drop frame timecode. First: \([10800 \times HH) + (1800 \times MM) = x]\. Then, \([x + (30 \times SS + FF) = y]\). Lastly, \([y – 2 \times (TD – (TD \ div 10))] = \text{frame number}\).\(^{34}\)

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\(^{34}\) Div is an integer division procedure without a remainder.
Chapter 3: *Bambi*

3.1: BACKGROUND

*Bambi* does not precisely conform to the aforementioned process of creating songs, then animation, and then score. During the film’s gestation, an animation director put a piano in his room at the studio in order to work more closely with the composers as they plotted the music and action together.\(^{35}\) Churchill and Plumb wrote some of the musical material first. Picture was then created to fit these melodies and motives.\(^ {36}\) Disney himself was heavily involved in the creation of the sound for *Bambi* as well: several recorded conversations recall his insistence on a high-quality score to make up for minimal dialogue. He believed music “will add to the greatness if you do have a marvelous musical score, one that expresses the action and gives force to it.”\(^ {37}\)

The aesthetic in his films most closely resembled nineteenth century operetta, evidenced by the Silly Symphonies and his 1937 masterpiece, *Snow White and the Seven Dwarfs*.\(^ {38}\)

*Bambi* is notable for its short script of nine hundred words, and almost wall-to-wall music.\(^ {39}\) At the most emotionally poignant moment in the film, when Bambi learns his mother

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\(^{36}\) Care, “Threads of Melody,” 82.

\(^{37}\) Care, “Threads of Melody,” 80, 84.

\(^{38}\) Care, “Threads of Melody,” 78.

\(^{39}\) Care, “Threads of Melody,” 80.
died, however, there is a startling seventeen seconds of total silence, a stark contrast to the rest of the scene, which has the constant support of underscore.\(^{40}\)

*Bambi* (1942), though not touted as an animated musical, has both songs and score. An off-screen choir sings four songs in the film: the opening credits ("Love is a Song"), "Let’s Sing a Gay Little Spring Song," "I Bring You a Song," and a scene depicting a rainstorm ("Little April Shower"). The choir is heard elsewhere in the film, but only as wordless instruments within orchestral cues. Churchill and Plumb created a Brahms-ian sound to accompany the sweeping forest landscapes and the coming-of-age story about a young deer, Bambi. Churchill largely wrote the tunes, while Plumb composed and arranged the orchestral cues. (Both were equally credited and earned Academy Award nominations for Best Song, "Love is a Song," and Best Original Score.) This paper analyzes two scenes from the film—Mother’s death scene (score) and “Little April Shower” (song)—to examine the rhythmic relationship between the on-screen action and both song and score.

In Mother’s Death scene from *Bambi*, peaks in alignment coincide with changes in dramatic tension. (We have determined tension levels subjectively, based upon the degree of urgency conveyed by the music, action and editing.) To demonstrate, we graph the fluctuation of tension relative to the alignment (see Figure 3.9).

3.2 “LITTLE APRIL SHOWER”

“Little April Shower” begins about sixteen minutes into the film. Thunder resounding through the forest motivates Mother and Bambi to return to the thicket and sleep. Bambi, still

\(^{40}\) Another significant moment of silence occurs at 00:32:30:20, just after Mother says, “Man was in the forest.” This dwarfs the silence in Mother’s death scene by 7 seconds (it is only 10 seconds as opposed to 17 seconds.)
quite young, has yet to see rain. When it starts to drizzle, he watches each raindrop with curiosity until it swells into a heavier shower. As the raindrops multiply, the scene shifts away from Bambi in the thicket to various other forest creatures as they try to escape the rain: a quail and her chicks traverse a small stream, a squirrel climbs into his tree hole, a robin flies to her nest and shelters her babies, and a mouse scurries from covering to covering until he finds his nest. The rain brews into a great storm and the cracks of lightning terrify Bambi as he darts around the thicket. Mother tries to calm him with gentle licks. With a particularly loud crash, the storm subsides and the sky clears to show bluebirds shaking water from their wings. The scene returns to its opening with the rain slowing to single raindrops and serenity in the forest restored.

In “Little April Shower,” the alignment of music and visual events mirror the inner drama. When characters are frightened or submerged in the storm, reflecting the presence of danger, alignment decreases. As each character reaches shelter and peace returns to their natural environment, alignment increases. At the start of the storm, raindrop splashes and Bambi’s subsequent reactions mostly work in time with the music. This introductory segment (recapitulated at the end) exemplifies Mickey Mousing, as each raindrop matches to a clarinet note. But as the rain intensifies and we experience the chaos of the storm, the on-screen action separates from the music (Figure 3.1a-b). It is when each character settles into their shelter, reconciled to the situation, that the action realigns with the music. For example, the visuals realign with the music when the mother bird settles into her nest to protect her babies. This happens again when the mouse reaches his nest. Later, when the thunder (represented by cymbal crashes) frightens Bambi, Mother remains calm. Although skittish, Bambi is protected by Mother and their den. After the storm retreats, another stretch of synchronization occurs as the sunlight
peeks through the clouds and the bluebirds shudder. The raindrops return in time with the clarinet melody, but eventually unravel as the tempo slows and the water stops dripping.

Figure 3.1a-b marks selected moments keyed to the numbered sections of this paper. Each exemplifies the idea that alignment of music and action symbolizes safety and consonance with nature, while non-alignment symbolizes some sort of dissonance.

Figure 3.1a: Alignment throughout “Little April Shower,” mm.1-88
Two streams of action dictate the pacing of “Little April Shower”: the raindrops splashing and the animal reactions. It takes a few measures for Bambi to sync with the raindrops, as he learns to anticipate the rain (Figure 3.2). After observing several drops, he is able to anticipate the rain and his movements align with the music. The scene shifts away from Bambi as the precipitation picks up, but he passes through the lower-left corner of the frame again at measure 23 (Figure 3.3). Comfortable in the shelter of the thicket, and at one with the natural rhythm of the rain, his movements coordinate with the music. This also coincides with the start of a musical phrase in the song (“What can compare with your beautiful sound”), effectively unifying music and action. This text returns several times and always aligns with the action.
Figure 3.2: Storyboard score for “Little April Shower,” mm.1-3
This sense of safety from the elements recurs as each animal or animal family ducks into a nest or a hole. At measure 70, the mouse hops into a nest in perfect time with the music as he escapes the rain (Figure 3.4). This too coincides with a musical phrase. Furthermore, the phrase repeats the lyrics from the phrase at measure 25 (“What can compare with your beautiful sound”), mentioned above. The repeated text in alignment with these events strengthens the correlation between music and action as an association emerges between lyrical and onscreen content. This is the last line of text sung by the choir before the “storm” section.

Figure 3.3: Storyboard score for “Little April Shower,” mm.23-26

Figure 3.4: Storyboard score for “Little April Shower,” mm.70-71
The storm intensifies at measure 91, at which point the animation veers from the animal characters and focuses on the landscape. Lightning is introduced, musically-represented by a cymbal crash, and visually aligned to the music. Immediately after, the visuals fail to align with the music, signifying Bambi’s fear and anxiety as well as the chaos of the storm (Figure 3.5). While a part of nature, the storm upsets the community of forest-dwellers. As the chaos increases, the alignment decreases.

![Storyboard score for “Little April Shower,” mm.90-91](image)

Figure 3.5: Storyboard score for “Little April Shower,” mm.90-91

After an extended period of action-filled moments, the number of notable frames decreases dramatically in measures 98-109, when we see different views of the forest briefly lit by lightning. Although the action is sparse, it continues to align with the music and contributes to
the peak in alignment during the portion of the scene. As we will see repeatedly in the Mother Death Scene, the momentary high degree of alignment smooths the transition into a period of greater musical and dramatic tension; once that increased tension level is reached, however, alignment tends to decrease. That is the case here, despite the two moments where Bambi, calmed by Mother’s slow and deliberated actions in the protection of the thicket, reconciles himself to the alarming storm.

Visually and musically, the scene climaxes at measures 129-131 (Figure 3.6). The three frames of lightning extracted from the sequence do not line up with any part of the music. In part, this is explained by nature: lightning precedes thunder because light travels faster than sound. But consistent with the rest of the film, it can also be explained as vehicle to heighten the tension of the scene. While the storm itself is a part of nature, it threatens the characters and prevents a feeling of safety and consonance with nature. This misalignment is reflected in the troughs in both the blue frame alignment line and in the green and red moving average trend lines in Figure 3.1b. It coincides with the dramatic and musical climaxes, and intensifies the perceived chaos of the storm.
The forest creatures reconcile with nature when the storm has cleared and the bluebirds chirp. Figure 3.7a-b illustrates the choreographed movements of these birds in time with the *accelerando* interlude before the return of the song. Each shake and chirp energizes the increasing tempo and reinforces the return to peace between the characters and nature, while the formerly-upsetting storm gradually ceases to play a relevant role in setting the tone for the scene.
Figure 3.7a: Storyboard score for “Little April Shower,” mm.140-143

Figure 3.7b: Storyboard score for “Little April Shower,” mm.144-147
Musical and visual events separate at the end of the scene as the rain and the clarinet slow at differing speeds (Figure 3.8a-b). The unraveling signals the end of the sequence and the end of the close marriage between song and film in the scene. Unlike other moments of misalignment, this does not symbolize chaos or danger. Instead, it is a means to disengage the viewer from the perpetual motion of the rain, musically represented by the four-note clarinet gesture. The slow *ritardando* prepares us for the end of the song and scene. The celesta coda, perfectly aligned with three raindrops, reminds us of what was: a musical journey described by nature’s rainstorm song.

Figure 3.8a: Storyboard score for “Little April Shower,” mm. 160-161
Figure 3.8b: Storyboard score for “Little April Shower,” mm.162-163

Misalignment between visuals and music in “Little April Showers” accompanies moments when characters are caught in the rainstorm, in contrast to moments of high alignment when they reach shelter. Trend lines in alignment charted in Figures 3.1a-b show a clear delineation in the scene between song (anecdotal instances when animal characters seek shelter) and score (an intense and chaotic storm that frightens them). The most intense part of the storm coincides with the greatest duration of misalignment in measures 121-134. Alignment is quickly restored as the storm subsides and peace is restored in the forest.

3.3 WINTER

Mother’s Death Scene begins a little more than halfway through the film. At its start, Bambi and Mother graze on new spring grass in a snowy field. Gleeful in their find after a long foodless winter, the two are initially oblivious to a predatory onlooker positioned on the edge of the field. Mother quickly senses danger and they flee toward their thicket home. After a tense
chase, a gunshot resounds in the wood; Bambi completes the journey to safety alone. Upon returning to the thicket, he calls out to Mother, who is no longer following him. Bambi wanders the forest calling for Mother until he runs into The Great Prince of the Forest, his buck father who presides over the woods. The Great Prince tells Bambi that Mother cannot be with him anymore and takes the young fawn under his charge.

Significantly, the level of tension increases throughout this scene, in a tiered manner. Alignment between on-screen action and musical moments strengthen dramatic transitions and support increases in tension. At the start of each new tension-level the visuals are saturated with actions that coordinate with the music; such coordinated moments at the start of each new tension level typically coincide with a new visual or musical idea. Once a tension level is well established, however, the score and visuals become somewhat misaligned. This cycle of alignment at the start of a new tension tier, and non-alignment later in that tier, repeats with each additional tension tier. The repetition of this relationship anticipates sections later in the scene where the score withdraws, but where the action continues to support the same tempo.

As indicated, when the dramatic tension in the scene increases, alignment between music and visuals is only momentarily high. Sustained alignment only occurs at moments when characters have adapted to the danger and found shelter in their environment. Thus the convergence and divergence between music and on-screen action reflects the consonance and dissonance in the drama of the scene, with rhythmic alignment between music and action reflecting consonance between the characters and nature, and rhythmic misalignment reflecting dissonance in the characters’ relationship to their environment. In this way, the music collaborates with animation to subtly narrate a relationship between the characters and nature, which directs the arc of the film as a whole.
Figure 3.9 charts the rise and fall of the tension in comparison to the percentage of aligned frames. The tension (shown with the black line) increases four times before retreating to a plateau at m.41, when Bambi reaches the safety of the thicket; as stated, each increase in tension is accompanied by a momentary increase in frame alignment (the blue line).\(^41\) Nevertheless, as shown by the green trend line, the overall increase in tension from m.17 to m.34 is accompanied by an overall decrease in frame alignment percentage; as the danger becomes more imminent, the action and visuals misalign. This heightens the perceived dramatic tension until the most poignant moment of the scene: the off-screen gunshot.

![Figure 3.9: Alignment/Tension throughout “Winter”, mm.1-41](image)

We now examine several portions of this scene more closely. Moments examined in this paper are marked in Figure 3.9, keyed to the section numbers below.

\(^41\) Gaps in the alignment line in this graph—represented by dotted lines—represent moments when there are no notable frames, thus no reference for alignment.

\(^42\) All images extracted from the 2005 re-mastered DVD of *Bambi.*
The high rate of alignment reflects the peacefulness of the scene (Figure 3.10). Here, the action moves slowly, focusing on the patch of grass for about five seconds, or five measures. The playfulness in the music parallels Bambi’s own playfulness as he bounds into the frame (subsequent to Figure 3.11) in response to Mother’s call. In these moments when Bambi and his mother are at one with nature, there is a greater occurrence of visual-musical rhythmic congruence.

Man, the hunter, interrupts the peace in the music, but never appears on-screen. Rather, his character is asserted through a three-note ascending semitone motive (Figure 3.11). While present in the score, Mother and Bambi remain oblivious of his existence for roughly ten
seconds; the alignment between frames and music consequently continues. As Mother senses the presence of danger she moves her head in sync with this motive, in tune with her surroundings. It is not until after she confirms danger that the musically-important moments cease to support the visually-important moments (Figure 3.12). The following misalignment then represents the upset—the dissonance—in the peace and oneness between the deer and nature. When she tells Bambi to run (“Bambi. Quick! The thicket!”), the music and action disassociate.

Figure 3.11: Storyboard score for “Winter,” mm.18-20; Man’s motive
After reaching a climax at the beginning of measure 33, the music stops, and remains absent through measure 34. The gunshot sounds on the last eighth note of measure 33; the sudden increase in tension level accompanying the gunshot is supported by on-screen moments continuing the earlier musical tempo (Figure 3.13a). As the music drops out, Bambi jumps over and disappears behind the snow bank, marking the off-the-beat eighths of measure 34 (Figure 3.13b). Although we hear the gunshot and do not see Bambi, the alignment signals his safety.
Figure 3.13a: Storyboard score for “Winter,” m.33
The tension settles down to a plateau at measure 41 as Bambi reaches the safety of the thicket. Though not as tense as previous portions of the scene, the ambiguity of Mother’s fate sustains a moderate level of tension until measure 80 (just before the end of the scene). The silence at the end of measure 45 and into measure 46 accompanies Bambi’s realization that Mother did not reach the thicket (Figure 3.14a). His dialogue, an abbreviated repetition of “We made it!” marks the tempo before an anxious diminished chord enters in the following measure.

Another significant section of silence (about five seconds) ensues. As Bambi has found cover in the thicket, the alignment remains high (Figure 3.14b). The score enters as Bambi calls for Mother. All the while, the action matches the music, reinforcing Bambi’s safety. Churchill and Plumb recycled this choral cue exactly from a previous winter scene in which Bambi and
Mother search for food in a blizzard; the all-female choir represents maternal protection. In the earlier scene, Bambi was cold and hungry, but Mother took care of him and showed him how to find food amongst snow. Here, nature marches on with or without Mother, and Bambi must use what he knows to survive.

Figure 3.14a: Storyboard score for “Winter,” mm.44-47
Bambi meets the Great Prince of the Forest at measure 70. Leading up to that moment, in measures 53-70, Bambi’s awareness of his mother’s absence sinks in. The increasing dissociation between Bambi and his surroundings at this point is marked by decreased alignment between visuals and music (note the trough at m.70 in the green alignment trendline in Figure 3.9). The simultaneous end of the maternal choral music and the arrival of Bambi’s father reinforce this acceptance of death.

Measure 70 precedes the momentous seventeen-seconds of silence, but marks the end of the choral cue. Despite this ending, the meter and tempo continue, with notable frames aligning with every beat in the measure (Figure 3.15a). Misaligned frames display Bambi’s surprise at seeing the Great Prince, as he jumps back in m.71. But, alignment returns promptly, and remains until Bambi reacts to the grim news in measure 72 (Figure 3.15b). When the total silence (devoid of dialogue, sound, or score) begins at 73, every frame aligns with the underlying tempo until the
end of 77 (Figure 3.15c). Action is sparse, in favor of stillness, while Bambi and the Great Prince process the information. The poignancy of the silence combined with the synchronized action and the placement in the film emphasizes the dramatic impact of the moment, even without music actually being present. The continuation of the tempo indicates that Bambi will be taken care of and that everything will be okay despite the circumstances. In the absence of music, the visuals sustain the tempo to comfort the audience as we cope with the traumatic loss.

Figure 3.15a: Storyboard score for “Winter,” mm.70-71

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43 Fittingly, this section almost perfectly coordinates with the Golden Section of the film. 42.833 minutes at the start of silence / 69.600 total minutes of film = .615.
Figure 3.15b: Storyboard score for “Winter,” mm.72-73

Figure 3.15c: Storyboard score for “Winter,” mm.74-77

A tear forms in Bambi’s eye and he lifts his head in time with the start of the last musical cue. A melancholy string quartet personifies Bambi’s heartache (Figure 3.16a). The increased
alignment supports nature and the natural state of affairs, while Bambi copes with the murderous Man and his gun, the antithesis of nature; though Bambi has survived the tragedy, he has the opportunity to live out his years naturally (Figure 3.16b). The Great Prince of the Forest, linked to nature as the regent of the woods, takes on the role of protector and representative of adult masculinity as he guides Bambi away from their meeting place and from Bambi’s youth and anguish. The synchronization between music and Bambi lowering his head signifies his acceptance of the loss of his mother and of the circle of life, reuniting him with nature as the scene comes to a close.

Figure 3.16a: Storyboard score for “Winter,” mm. 78-80
The rhythmic visual-musical alignment functions in two ways in this scene: 1) as momentarily-greater alignment between music and action is paired with increases in tension, it serves to anchor Bambi and the audience at those moments; 2) extended moments of alignment highlight when Bambi is at one with nature and safe in his environment.

On the brink of winter into spring, this scene parallels Bambi’s own maturation. Learning of Mother’s death—and being alone as a result—catapults him into adolescence in the scene immediately following. It is no accident that the choral cue—previously associated with Mother and maternal protection—comes to an end as the Great Prince of the Forest arrives. Despite these differences, the underlying principles of the rhythmic diegesis remain intact.

3.4 CONCLUSIONS
Alignment between onscreen action and music plays an essential role in the dramatic development of the scenes examined in Bambi. This analysis reveals a conscious pairing between the rhythm of the action and the rhythm of the music that—exclusive of the actual musical content—enhances the dramatic impact of a given scene. Areas of increased vs. decreased alignment have different significance. Changes in tension, whether it involves a race for survival or a loud storm, coincide with momentary increases in alignment.

The alignment between music and action in Bambi, furthermore, amplifies significant moments, revealing information about the characters’ relationship to their natural environment. In some scenes, the music represents the forest, which otherwise does not have sonic representation; synchronization between music and action thus mirrors the dramatic moments when characters are at one with nature, and thereby allows the action to carry music during silences.

This coordinated relationship integrates the music as a character and storyteller into the film: the score provides crucial information about the relationship between personified characters, nature, and imminent danger. Chronicling the relationship between Bambi and his natural surroundings underscores the heart of the film: Bambi’s maturation. As Bambi matures throughout the film, his ability to cope with danger, and the resulting relationship with nature, strengthens. For Bambi, the storyboard scores and line graphs make clear how Churchill and Plumb’s score draws attention to the relationship of Bambi and the other forest creatures to nature, in general, and to the significance of silence in this developing relationship, in particular.44

44 The close collaboration between Churchill, Plumb, and the animators suggests that the intimate relationship between music, action, and tension was purposeful.
CHAPTER 4: The Lion King

4.1 INTRODUCTION

Disney joined composer Hans Zimmer and singer-songwriter Elton John for the 1994 megahit *The Lion King*. Pitched as “Bambi in Africa” with parallels to *Hamlet*, the picture followed the story of lion cub Simba, who is exiled from his pride after his uncle, Scar, leads him to believe he caused the death of his father, Mufasa—the pride’s king. He is taken under the wing of a meerkat (Timon) and a warthog (Pumbaa). The comedic duo teaches the predatory Simba to eat insects, enjoy a carefree life in the jungle, and forget his past. A chance encounter with Simba’s childhood friend Nala, and her insistence on his return to save the pride, instigates an existential crisis. Spiritual guide Rafiki, a baboon, reminds Simba that Mufasa lives on in his son, (“He lives in you.”) and Simba has a vision of his father. Mufasa’s apparition instructs Simba to embrace his identity and to take his rightful place as king. Invigorated by the vision, Simba returns to his pride. In a violent confrontation, Simba learns Scar is responsible for Mufasa’s death. He defeats Scar and takes his place in the circle of life as water, vegetation, and animal herds return to Pride Rock.

Elton John penned songs while Hans Zimmer and Lebo M. created the score. The three combined elements of pop, rock, classical and African music for the final product. Unlike *Bambi*, analysis of the relationship between all movement, dialogue, editing and music is unremarkable. However, analysis of individual characters’ movements and music yield more interesting results. Wherein *Bambi* closely follows the journey of the title character as he contends with the dangers of the forest, *The Lion King* focuses on Simba’s internal conflicts.
4.2: “FATHER’S FOOTSTEPS”

This scene happens early in the film, when Mufasa scolds a young Simba for wandering into dangerous territory. Though he feels guilty, Simba defends his transgression as an act of bravery, a quality he admires in his father. Mufasa teaches Simba that “being brave doesn’t mean you go looking for trouble,” and the two reconcile. The scene closes on a solemn note as Mufasa tells Simba that the kings of the past live on in the stars and will always be there for guidance.

A graph of overall alignment in this scene yields three major spikes amid an otherwise unremarkable passage of moderately-low-level musical-filmic congruence (Figure 4.1). The first of these spikes occurs at measure 6, when Simba sits next to Mufasa with his head hung (Figure 4.2). Simba feels guilty for disobeying his father and is furthermore embarrassed to need rescuing from the hyenas.
Figure 4.1: Alignment throughout “Father’s Footsteps”
The second occurs at measure 26, when Simba playfully wrestles with Mufasa, signaling their reconciliation and demonstrating their close relationship (Figure 4.3).
The last major increase in alignment occurs at measure 40 after Mufasa says that the kings of the past “will always be there to guide you, and so will I” (Figure 4.4). At this moment, the camera angle changes to a wide shot, and the scene concludes with a visual of Mufasa and Simba looking up at the stars. This foreshadows the later scene, during which Simba confers with Mufasa’s spirit floating amongst the stars.
These moments depict an arc throughout the scene as Simba learns about responsibility, empathy, and forgiveness, concepts he must understand to be a good king and mature adult. At the start, he acknowledges his mistake, though only in that he defied his father. It is only through their conversation that he understands that the boundary rules exist to protect Simba and keep Mufasa from worrying (“I guess even kings get scared, huh?”). Mufasa lightens the mood with playful wrestling. It is a symbol of his forgiveness of Simba’s transgressions and his love for his son. Mufasa imparts his last wisdom to Simba: to be humble and ask for help when needed.
There is no shame in looking for guidance at any age. “Father’s Footsteps” is a powerful scene and ends on a tender note, but Simba is a young cub and understandably does not grasp these concepts until later.

Although the overall rate of alignment is largely unexceptional (but for those three spikes), alignment can also be chronicled for each character. This analysis yields a more drastic graph when editing information is excluded.

Simba’s movement and dialogue align to music most notably in four places (Figure 4.5). Two of these coincide with the similar spikes in alignment in measures 6 and 26 discussed in the overall analysis above.

Figure 4.5: Simba’s alignment throughout “Father’s Footsteps”
The second increase in alignment occurs at measure 22, just after Simba says, “Those hyenas were even scareder” (Figure 4.6). The line incites laughter from Mufasa and shifts the mood from somber reprimand to playfulness. The last increase in alignment occurs at measure 33, as Simba gazes at the stars while Mufasa tells him of the kings of the past (Figure 4.7).

Figure 4.6: Storyboard score for “Father’s Footsteps,” m. 22
Figure 4.7: Storyboard score for “Father’s Footsteps,” m. 33

Mufasa’s alignment hovers around 50% for the majority of the scene (Figure 4.8), increasing to 100% only at measure 18, which directly follows his telling Simba, “I thought I might lose you” (Figure 4.9). This moment emphasizes Mufasa’s “realness”; to Simba he is a fearless leader, while in reality he is a concerned father who is terrified at the thought of losing his only son.
Figure 4.8: Mufasa’s alignment throughout “Father’s Footsteps”
The separate graphing of character alignment allows us to compare each character’s movements (Figure 4.10). In the combined Simba-Mufasa alignment graph, it is clear that the characters are “out of sync” with each other except in two places. In measures 9-15, both characters hover around 50% alignment. This stretch covers Mufasa’s scolding and up to the point when Simba responds, “But you’re not scared of anything.” The second stretch of alignment occurs at measures 29-35. Here, Simba asks, “We’re pals, right?” Mufasa confirms and then begins his speech about how “the great kings of the past look down on [them] from
[the] stars.” Still, the general unsynchronized nature of their movements and dialogue to the music suggests a lack of synchronicity between the two characters; the young and naïve Simba struggles to grasp the mature concepts of bravery, responsibility, and death while Mufasa’s confidence in these topics is unwavering.

![Figure 4.10: Character alignment throughout “Father’s Footsteps”]

4.3: “MUFASA’S GHOST”

Much later in the film, Simba runs from Nala after they argue about his return to the pride; she insists, he refuses. He paces back and forth as he grumbles about the worthlessness of going back to Pride Rock and his inability to change the past. It stirs up feelings of guilt and
sadness connected to Mufasa’s death. His grief is interrupted by the sound of a baboon swinging from the branches of a nearby tree and singing a nursery rhyme. Rafiki reveals he knows Simba’s identity and that Mufasa is alive. He leads Simba through a dense jungle to show Mufasa to him. When they exit the jungle, Rafiki parts the grass near a pond and instructs Simba to look at his reflection. Simba’s reflection in the water morphs into an image of Mufasa, and Rafiki’s words “He lives in you” precedes a vision of Mufasa in the clouds. The cloud apparition of Mufasa tells Simba that in forgetting himself, he has forgotten his father. He must return to Pride Rock to take his rightful place in the circle of life and always “remember [who] he is.” The clouds recede and Rafiki tells Simba that “the past can hurt…[but] you can either run from it or learn from it.” Before the end of the scene, Simba decides to return to Pride Rock.

A graph of overall alignment reveals three main arcs in the scene (Figures 4.11a-b). The first, in measures 32-71, includes all action from the beginning of the scene until Simba chases Rafiki to learn about the connection between the monkey and his father. Another arc of alignment spans from measures 72 to 109, when Simba first looks at his reflection in the pond.
Figure 4.11a: Alignment in “Mufasa’s Ghost,” mm.32-116

45 The graphs for “Mufasa’s Ghost” begin at m.32. The first 31 measures belong to a transitional scene that does not directly relate to the musical or narrative themes in the sequence examined.
The last arc of alignment in this sequence begins in measure 110, during which Rafiki insists that Simba “look harder” at the reflection, which morphs into an image of Mufasa. The arc extends to the end of the scene when Simba decides to run back to Pride Rock.

The comparative charting of the three characters in the scene (Simba, Rafiki, and Mufasa), shows a similar tri-partite architecture (Figures 4.12a-b). Simba’s movement and dialogue maintains a relatively consistent level of alignment (around 60%) throughout the scene, with major increases only occurring in the last section during and after the vision of Mufasa. The first of these major increases occurs in measure 113, when Rafiki tells Simba to “look harder” at his reflection (Figure 4.13). Simba turns his head slowly as Rafiki points to the water, which ripples and transforms Simba’s reflection into Mufasa’s. At measure 132, the alignment of
Simba’s movement with the music peaks when he blinks, taking his last look at the illuminated ghost of Mufasa, who tells him to remember his true identity as king (Figure 4.14). The last sharp increase occurs in measure 139, after the clouds recede and Rafiki has returned (Figure 4.15). This synchronization signifies Simba’s comprehension of the lessons Mufasa taught him in “Father’s Footsteps;” Simba must forgive himself and take responsibility for saving the pride. In forgetting himself and Mufasa, Simba has avoided adulthood and rejected the natural order.

Figure 4.12a: Character alignment throughout “Mufasa’s Ghost,” mm.32-99
Figure 4.12b: Character alignment throughout “Mufasa’s Ghost,” mm.100-161
Figure 4.13: Storyboard score for “Mufasa’s Ghost,” m.113
Figure 4.14: Storyboard score for “Mufasa’s Ghost,” m.132
Figure 4.15: Storyboard score for “Mufasa’s Ghost,” m.139

Individually, these moments have little meaning, as they relate only to slight movements in the form of eye blinking and head turning. However, it is notable that they occur in the latter portion of the scene, when Simba is confronting his past and opening up to the possibility of returning to Pride Rock to fulfill his destiny.

Conversely, Rafiki’s highest points of alignment occur during the first parts of the scene. His first appearance in the sequence coincides with the music in measure 42 as he bounces on the branch of a nearby tree (Figure 4.16). Overall, his synchronization with the music is sporadic, with sharp increases and decreases evident in the alignment graph.
The next peak occurs when he says, “look down there,” having parted the grass for Simba to look at his reflection in the water (Figure 4.17). It punctuates a period of silence following the chaotic journey through the jungle. The last significant moment of alignment occurs at the pivotal moment when Mufasa’s reflection replaces Simba’s and Rafiki comments, “You see? He lives in you” (Figure 4.18, 4.13, 4.19). Again, most of these movements are brief and relatively insignificant. But the separation of the characters’ actions show that Rafiki’s synchronization with music hits its highest points while he serves as a spiritual guide earlier in the scene. And
though he does dispense advice at the end of the scene, Simba has already decided to return and only contemplates how difficult it will be to go back and face his past. At this point, Rafiki serves only to encourage Simba to follow through.

Figure 4.17: Storyboard score for “Mufasa’s Ghost,” mm.102-104
Figure 4.18: Storyboard score for “Mufasa’s Ghost,” m.112
Mufasa’s ghost peaks in two notable places when he reminds Simba to “Remember who you are,” a line further emphasized by its repetition (Figure 4.20a-b).
Figure 4.20a: Storyboard score for “Mufasa’s Ghost,” m.133
Figure 4.20b: Storyboard score for “Mufasa’s Ghost,” m.134
4.4 CONCLUSIONS

Analysis of the rhythmic interaction between music and film elements highlights Simba’s coming-of-age as guided by his father, Mufasa, and spiritual guide, Rafiki. An all-inclusive alignment graphs are unremarkable. But charting the alignment of each character focuses the data on the central theme of the film: Simba’s maturation. High rates of musical-filmic
congruence coincide with Mufasa and Rafiki’s transference of wisdom to Simba. After all, Mufasa and Rafiki are static, mature characters whereas Simba is a dynamic and evolving hero. Much like in *Bambi*, Simba’s actions increasingly align with music as he grasps concepts necessary for his survival and success in the circle of life.
CHAPTER 5: WALL-E

5.1: BACKGROUND

Andrew Stanton’s WALL-E (Pixar, 2008) follows the titular character (Waste Allocation Load Lifter: Earth class), a robot designed to compact waste on a deserted, life-prohibitive Earth in 2815 A.D., as he falls in love with another robot and travels in space to follow her. Dialogue is sparse underneath an abundance of bleeps and whirrs to describe WALL-E’s reactions and movements. Consequently, Thomas Newman’s score fills the gaps to musically describe WALL-E’s curiosity, wonder, and affection.

On Earth, WALL-E watches Hello, Dolly! every night, hoping for a dance and romance similar to what he sees onscreen. Several songs round out the sonic world of WALL-E including “Put On Your Sunday Clothes” and “It Only Takes a Moment” from Hello, Dolly!, Louis Armstrong’s version of “La Vie en Rose,” and an original “Down to Earth” by Peter Gabriel for the ending credits. The songs from Hello, Dolly! are used as source music: “Put On Your Sunday Clothes” plays over the opening credits and transitions into the scene as music played over loudspeakers at the fictional BnL supermarket. WALL-E later watches a videotape of the film and emulates the handholding in “It Only Takes a Moment” to counteract his loneliness. This moment defines WALL-E’s motivation: a quest for the physical affection of handholding.

Physically, WALL-E is synthetic, but his emotions and reactions are quite human. In the beginning, he is portrayed like a curious kid as he naively interacts with the leftover waste on Earth. He collects interesting objects for practical reasons—to repair himself—and for novelty, as he carries out his intended directive to compact and stack waste. One day, a spaceship drops off EVE (Extraterrestrial Vegetation Evaluator), an elegant modern robot; WALL-E is instantly
enamored. As he shows EVE his prized possessions, he presents a plant he found amongst the waste; she immediately seizes it and shuts down. The spaceship returns to collect EVE (with the plant sample) sending WALL-E on a desperate chase to follow his beloved. He latches onto the spaceship just before takeoff and rides along as it launches into outer space. He reconnects with EVE aboard the Axiom, a space station home to the descendants of those who fled Earth. After several mishaps along the way, WALL-E becomes a hero to EVE for saving the plant from being destroyed by the malicious Autopilot, thus aiding her prime directive to deliver the plant to the captain. The two celebrate by dancing in space around the Axiom, fulfilling WALL-E’s dream for a love and a dance, like Hello, Dolly! Having achieved his pre-adolescent desires, WALL-E then matures and turns his attention from his own wants to caring for others. Working together, he and EVE return the plant to the ship’s captain and help him to send the Axiom to Earth to repair and recolonize.

Music plays a critical role not only in the plot (inspiring WALL-E’s hopes for romantic companionship like what he sees in Hello, Dolly!), but in the storytelling—portraying what is not apparent onscreen. Understanding the score requires a close inspection of the action it accompanies, especially since there is very little dialogue to explain the thoughts, feelings, and reactions of the characters.

5.2: “Work Day”

At the start of the film, WALL-E groggily rolls onto the roof of his abode to recharge via solar panels. He mimics “human” life by charging overnight and waking up to work during the day. His pet cockroach, Hal, accompanies chirping and skittering about to provide comic relief. Throughout the scene, WALL-E naively interacts with Earthly objects – a paddle ball, a fire
extinguisher, a bra – collecting some in a travel cooler he carries like a kid carrying a backpack. These interactions suggest that he is similar to a child, exploring the world around him. The alignment trajectory highlights his collection of and interaction with these objects, including the rather exceptional discovery of the plant (Figure 5.1).

![Figure 5.1: Alignment throughout “Work Day”](image)

As WALL-E begins his workday, most of his and Hal’s movements oppose the rhythm of the score (Figure 5.2). But as they move to the interior of WALL-E’s shelter, there is an

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46 Titles of cues are taken from scores provided by the Disney Music Department and do not necessarily correspond to titles used on the soundtrack.
increased alignment between the editing and the tempo of the music (Figure 5.3). He settles into a familiar routine, which is all the more apparent by this synchronization.

Figure 5.2: Storyboard score for “Work Day,” mm. 1-2
Once the music drops out completely at the end of measure 7, WALL-E’s motions and the editing (e.g. camera angle changes and entrances or exits into and out of the frame) continue the tempo of the previous musical section. The off-the-beat rhythm of the action mimics a dance pattern, exemplifying his romantic desires; this rhythm is shown in the “action line” of the storyboard scores shown in Figures 5.4a and 5.4b; similar rhythms can be found later in the movie, as well.
Figure 5.4a: Storyboard score for “Work Day,” mm. 8-9
When WALL-E encounters a bra amongst the debris, he places it over his comparably sized eyes. It is symbolic of his naïveté and inexperience with women and romance. The exploration and experimentation with human artifacts are attempts at understanding people—the characters he watches onscreen. The placement of the bra on his eyes and his vocal reaction (“ooh”) align rhythmically to the score (Figure 5.5a). Tossing the bra into his cooler backpack notably continues this alignment (Figure 5.5b).
Figure 5.5a: Storyboard score for “Work Day,” mm. 29-31
Later in the scene, WALL-E finds and inspects a fire extinguisher (Figures 5.6a-b). The two synchronized frames seem unimportant amidst the many red-boxed moments, but the fact that they align specifically when WALL-E first touches the extinguisher after a stretch of misalignment is significant. This is underscored by what follows. WALL-E locates the trigger and tests the extinguisher with a short spray. He then engages the trigger more continuously. The explosive discharge frightens WALL-E and he subsequently throws it onto a heap of trash. As the extinguisher soars through the air, the score drops out. But the onscreen action and sound effects continue the tempo (Figures 5.6c and 5.6d). Despite his momentary fear here, his new understanding of the fire extinguisher’s mechanics will help him later propel through space.

Figure 5.5b: Storyboard score for “Work Day,” m. 32
rhythmic synchronization draws attention to this otherwise insignificant moment in the narrative for “Work Day.”

Figure 5.6a: Storyboard score for “Work Day,” mm. 45-46
Figure 5.6b: Storyboard score for “Work Day,” m. 47
Figure 5.6c: Storyboard score for “Work Day,” m. 49
The turning point in “Work Day,” and one of the two principle catalysts for the rest of the film, lies with WALL-E’s discovery of a plant inside a refrigerator on life-devoid Earth. The score veers from the playful work tune as WALL-E approaches a refrigerator. The music cues the impending moment of significance not only through tone, but also in its increasing alignment to the action (compare Figures 5.7a-b). The perspective changes to focus on WALL-E before the visual reveal of the plant. When he first lays eyes on the off-screen plant, the action, editing, and sound effects continue the “Work” tempo over the sustained “plant” music (Figures 5.7c-d). Alignment wanes as the plant comes into focus (Figure 5.7e). The misalignment here mimics the
out-of-focus visual. After the panning stops, the visuals re-start the “Work” tempo though the music continues with the plant theme in the flute (Figure 5.7f). This pattern of alignment-misalignment-alignment underscores the story: WALL-E stumbles upon something new—unlike anything else he has seen on Earth—and while he does not necessarily understand it at first, its importance is not lost on him nor on the audience.

Sound:

Editing:

Action:

Figure 5.7a: Storyboard score for “Work Day,” m. 58
Figure 5.7b: Storyboard score for “Work Day,” m.59
Figure 5.7c: Storyboard score for “Work Day,” m. 60
Figure 5.7d: Storyboard score for “Work Day,” m. 61
Figure 5.7e: Storyboard score for “Work Day,” mm. 62-63
In “Work Day,” WALL-E interacts with the wasteland remnants of a human world with childlike curiosity and naiveté. His musically-aligned actions show his familiarity with the work routine and reinforce his desire for a synchronous dance with a lover, much like what he sees in *Hello, Dolly!* As seen in Figure 5.1 (for example), while each new item with which he interacts – cooler, bra, extinguisher, plant – produces a moment of disruption the musico-visual alignment, the successive movements of heightened alignment demonstrate WALL-E’s successful processing of the object’s impact.
5.3 “Define Dancing”

The later scene when WALL-E and EVE fly around the Axiom reinforces the idea that the music and action create a synchronized dance, made apparent by the Storyboard Score (Figures 5.5-5.7). Just before the cue “Define Dancing” begins, WALL-E rescues the plant from destruction, thus saving EVE’s directive. EVE rewards him with a kiss and they “dance” around the Axiom. During the scene, we parachute into the ship to see Mary and John break away from the mechanical flow of hover chairs to watch WALL-E and EVE’s dance, sparking their own romance. Later, we see the Captain enthusiastically learning about life on Earth by asking the computer to define terms. This culminates with his request to “Define Dancing,” which catapults us back to the space dance, resolving with WALL-E and EVE returning to the ship to deliver the plant and complete EVE’s directive.
Music and visuals first begin to align when WALL-E recovers from the shock of receiving a kiss from EVE (Figure 5.9). At this moment, he also re-familiarizes himself with the fire extinguisher. Though previously overwhelmed by its power in the Work Day scene, he now sees it as a useful propellant.
Inside the ship, Mary breaks away from the stream of chairs to watch WALL-E and EVE dance. In awe of the beauty of the movement (for we must assume that she has never seen dancing considering her physical state), she reaches for the nearest chair to share the experience with another person. Coincidentally, she interrupts John’s entrancement and he joins her, recalling a past encounter with WALL-E. As they wave to WALL-E and watch the dance, they accidentally touch hands, at which point the synchronization between action and music increases significantly (Figure 5.10). The physical contact is unfamiliar in a society that no longer necessitates human interaction.
The camera moves to another area of the ship—the bridge—where the Captain excitedly learns about Earth from the computer. After hearing the word “Earth” from an earlier encounter with plant life, he asks the computer about various related words. The computer vocally defines the terms, which are accompanied by videos and pictures of terrestrial life on the monitor. At this point, the computer describes hoedowns, as an extension of the definition of farming (Figure 5.11a-b). The Captain’s synchronized movements emphasize his wonder and excitement.
Figure 5.11a: Storyboard score for “Define Dancing,” mm. 49-53
Inspired by the depiction of “hoedown,” the sedentary Captain asks the computer to “define ‘dancing,’” at which point we are catapulted back outside the ship to watch the culmination of EVE and WALL-E’s dance (Figure 5.12).
The rhythm of the music slows as the fire extinguisher’s supply runs out. WALL-E, unable to propel himself through space, floats momentarily until EVE holds him (Figure 5.13a-b). The alignment here demonstrates EVE’s affection for WALL-E and the tenderness between the two.
Figure 5.13a: Storyboard score for “Define Dancing,” m. 72
Alignment in “Define Dancing” traces the change in physical relationships between WALL-E and EVE and John and Mary. WALL-E indirectly causes Mary and John to experience their first physical interaction by distracting them from the mechanical routine aboard the Axiom. This relates to the Captain’s fascination with Earth as he too is reconnecting with nature by learning about past human life. The dancing definition and EVE holding WALL-E reaffirm WALL-E’s achievement of what he wanted most: a romantic relationship, symbolized through dance/hand-holding/kissing, just as he saw in *Hello, Dolly!*
5.4 Conclusions

On the surface, “Work Day” and “Define Dancing” exemplify WALL-E’s evolutionary arc in the film: at the beginning, his childlike curiosity of human world and romance send him on his main directive: to find love like what he sees in Hello, Dolly! By “Define Dancing,” he achieves the romantic relationship, understanding the joys of mutual affection through a synchronized dance. At this point in the film, he completes his main task, but the storyboard scores show a secondary directive to be accomplished by the end of the film: returning life (and humans) to Earth. The synchrony between film and music when he finds the plant in “Work Day” brings this to light. John and Mary similarly engage in a repetitive routine aboard the axiom, and it is WALL-E and EVE’s romantic dance through space that disrupts the monotony and aids in the secondary directive: to return people to Earth. As they watch the dance, their hands touch. The unfamiliar sensation of romance through physical contact is foreign to them because of the isolating hover chairs, complete with food delivery and video entertainment. The synchrony between music and action highlights the similarities between the two scenes: hand-holding/touching and dance as representations of love and WALL-E and the captain’s curiosity of Earth. These moments occur at the initiation and completion of personal (romance) and external (saving Earth) directives and support the underlying theme of the film: a love for Earth and the desire to protect and save it.

Alignment graphs successfully highlight moments of high and low alignment, which create a narrative arc themselves in these two scenes. The storyboard scores demonstrate the rhythm of the visuals and how they interact with the meter of the music; in both scenes, the action line reveals dance-like rhythms that differ from yet echo the dance-like music itself. Many
of these rhythms occur as blue-boxed events visuals aligning to the meter, but not a specific musical event (see Figures 5.4a, 5.6d, 5.7b-d, 5.7f, and 5.11a-b). It is clear then that a synchronized choreography exists between visuals and musical tempo. This differs from *How To Train Your Dragon*, for instance, in which the syncretic rhythm is based upon absolute musico-visual alignment (that is, green boxes).
CHAPTER 6: How To Train Your Dragon

6.1 INTRODUCTION

Former Disney chairman Jeffrey Katzenberg resigned following the production of The Lion King and founded DreamWorks as a rival to the animation giant in 1994. In 2010, he oversaw the production and release of How To Train Your Dragon based on a successful book series by author Cressida Cowell.

The story follows the timid adolescent Hiccup who struggles to please his father and their Viking community as he begins training to fight the dragons that terrorize their village and eat their livestock. Instead he is encouraged to hone his skills as a tanner and a weaponsmith to support the stronger, braver warriors. He builds a giant slingshot to capture a dragon and prove his worth to the village. As a result, he injures a rare and dangerous breed of dragon. No one in the village believes his story and he sets out to find the fallen creature and kill it. When he finds the dragon in the forest, the two lock eyes and he is unable to go through with the act. He frees the dragon, but it is unable to fly away due to a damaged tail fin. Hiccup begins to feed and tame the dragon, who he names Toothless for his retractable teeth. Throughout the resulting friendship, Hiccup learns more about dragons in general, gaining understanding of how to tame the dragons he is forced to fight in his training. He uses his knowledge and expertise as a tanner and weaponsmith to build a prosthetic tail fin and a saddle so he can fly with Toothless. On one of their flights, Toothless shows Hiccup and Astrid, another trainee, the dragons’ lair, where a massive dragon, the “Red Death,” eats the smaller dragons unless they bring him livestock. In a final battle, the Vikings team up with the dragons to defeat the Red Death. Hiccup is injured
during the battle, and awakes finding that his foot has been replaced by a prosthetic, much like Toothless’ injured tail. The Vikings now live peacefully alongside the dragons.

British composer John Powell provided the music for *How To Train Your Dragon*, having worked on *Antz* (1998), *Chicken Run* (2000), and *Shrek* (2001) for DreamWorks. Powell incorporated northern European elements like bagpipes and *sopilka*—a Ukranian folk flute—to create the soundscape for the fictional Viking town of Berk. He also drew inspiration from the temp track, which included music by Icelandic artist Sigur Rós.\(^{47}\) The score earned him an Academy Award nomination.

6.2 “FORBIDDEN FRIENDSHIP”

In the cue “Forbidden Friendship,” Hiccup approaches Toothless for the first time since freeing the dragon. He steps into the forest hollow holding a freshly caught fish and a pocketknife in his belt. Hiccup looks around for the dragon, but does not seem him perched atop a rock ledge, watching carefully. The dragon approaches cautiously, but very interested in the fish. He purrs and acts docile only when Hiccup drops his pocketknife and kicks it away. Hiccup offers the fish and when the dragon opens its mouth, he sees it has no teeth. Just as he utters, “Huh, I could’ve sworn you had–” sharp teeth erupt from the dragon’s gums. The dragon is henceforth named “Toothless.” He grabs the fish from Hiccup’s hands and swallows it in one bite. Then, as a sign of gratitude and friendship, Toothless regurgitates a portion of the fish as an offering to Hiccup. Hiccup reluctantly takes a bite of the fish to comply with the dragon ritual. He then smiles at Toothless and the dragon attempts to make a similar gesture with his mouth—a successful communication and understanding between the two. Hiccup reaches out to touch

\(^{47}\) John Powell, interviewed by Jennifer Dirkes, Los Angeles, CA, August 2016.
Toothless, but the dragon growls and darts across the hollow. The two coexist in separate areas of the hollow as Hiccup hopes that prolonged exposure would entice the dragon into further interactions. To pass the time, he draws in the dirt with a stick. Toothless notices and watches as Hiccup draws the dragon’s likeness. He then picks up a massive tree branch in his mouth and drags it in circles around Hiccup. A wide shot reveals a labyrinth drawing of twists and turns surrounding Hiccup. Hiccup steps on a line as a test, prompting Toothless to growl. But Toothless remains docile if he steps in the in-between spaces. Hiccup traverses the distance between himself and Toothless by “dancing” through the drawing labyrinth until he feels the dragon’s breath on the back of his neck. Hiccup reaches out to touch Toothless, but the dragon recoils. He lowers his head and extends his arm again and Toothless willfully touches his hand. Toothless twitches his nose after the physical contact and bounds across the hollow.

Visual-musical congruence in “Forbidden Friendship” is spasmodic throughout; while the moving averages hover around 50-60% (Figures 6.1a-b), oscillations reflect the tentativeness of Hiccup and Toothless as they search for common ground. Peaks in alignment accompany moments of successful communication between Hiccup and Toothless.
Figure 6.1a: Alignment throughout “Forbidden Friendship,” mm.1-67
The first increase in alignment between score and picture occurs just after Toothless regurgitates the fish (Figure 6.2). Hiccup offers the fish to Toothless, who swallows it in one bite. Toothless then regurgitates the fish and glances between it and Hiccup. Hiccup offers the fish to Toothless as a sign of friendship. Toothless then shares the offering with Hiccup as an equal gesture of friendship. Hiccup takes a bite of the fish, but hesitates to swallow. Toothless stares and nods, suggesting that Hiccup must swallow the fish to complete the ritual. It is here that music and action synchronize, highlighting their understanding of each other’s intentions (Figure 6.3).
Figure 6.2: Storyboard score for “Forbidden Friendship,” mm.16-19
Hiccup smiles after swallowing the fish. Toothless then tries to imitate Hiccup’s smiling. The successful interaction encourages Hiccup to reach out to touch Toothless, but the dragon bares his teeth, growls, and flies away (Figures 6.4a-h).
Figure 6.4a: Storyboard score for “Forbidden Friendship,” mm.37-38
Figure 6.4b: Storyboard score for “Forbidden Friendship,” mm.39-41
Figure 6.4c: Storyboard score for “Forbidden Friendship,” m.42
Figure 6.4d: Storyboard score for “Forbidden Friendship,” m.43
Figure 6.4e: Storyboard score for “Forbidden Friendship,” mm.44-45
Figure 6.4f: Storyboard score for “Forbidden Friendship,” m.46
Figure 6.4g: Storyboard score for “Forbidden Friendship,” m.47
Hiccup and Toothless part ways, but remain in the hollow. Although they connected over the fish, Toothless is wary of physical contact. But Hiccup is patient, and draws in the sand while he waits. Toothless sleeps hanging upside down, but looks for Hiccup as soon as he opens his eyes (Figure 6.5a-c). He has yet to lose interest in his human companion, though he keeps a safe distance.
Figure 6.5a: Storyboard score for “Forbidden Friendship,” m.62
Figure 6.5b: Storyboard score for “Forbidden Friendship,” mm.63-65
He approaches Hiccup from behind and watches him draw (Figures 6.6a-b and Figure 6.7). Hiccup draws an image likened to the dragon. Toothless sees this and waddles away on his two back feet. The awkward gait signals his playfulness and continued interest in Hiccup and the bond forming between the two.
Figure 6.6a: Storyboard score for “Forbidden Friendship,” mm.73-74
Figure 6.6b: Storyboard score for “Forbidden Friendship,” m.75
Toothless performs a somewhat clumsy dance as he drags a large branch in circles around Hiccup. A wide shot reveals the drawing that surrounds Hiccup (Figure 6.8). Hiccup surveys the labyrinth of twists and turns in the drawing.

Figure 6.7: Storyboard score for “Forbidden Friendship,” mm.81-82
Hiccup sensitively places one toe on a line in the drawing. Toothless growls until he lifts his foot. Hiccup tests this a few more times, with Toothless [seemingly] becoming content (evidenced by purring) when his foot does not touch the lines drawn in the sand. He then steps in the space between the lines and Toothless remains amenable (Figures 6.9a-d). Hiccup performs a similar dance as he makes his way through the labyrinth to reach Toothless on the other side. His understanding of the boundaries demonstrates the respect that Toothless requires.
Figure 6.9a: Storyboard score for “Forbidden Friendship,” mm.105-106
Figure 6.9b: Storyboard score for “Forbidden Friendship,” mm.107-108
Figure 6.9c: Storyboard score for “Forbidden Friendship,” mm.109-111
The dance lands Hiccup inches away from Toothless. He reaches out, but Toothless retracts (low alignment in Figure 6.10). Hiccup realizes that he must demonstrate respect to the dragon. He averts his eyes and lowers his head, then extends his arm (high alignment in Figure 6.11). Toothless closes the distance by pushing his nose into Hiccup’s palm (Figure 6.12). The physical contact is a sign of understanding and mutual respect, cementing the bond between the two.
Figure 6.10: Storyboard score for “Forbidden Friendship,” m.120-122
Figure 6.11: Storyboard score “Forbidden Friendship,” mm.126-128
“Forbidden Friendship” is the answer to question inherent in the film’s title: *how do you train a dragon?*: through communication, consideration, and respect. Peaks in alignment between music and film accompany successful moments communication between Hiccup and Toothless, chronicling their growing bond. These moments occur occasionally at first and more frequently in the later part of the scene as the two reach mutual ground.

6.3 “TEST DRIVE”
Hiccup and Toothless fly with the new prosthetic tail fin connected to a pedal. Hiccup consults his cheat sheet to set the pedal to tilt the fin in the right direction. It is a bit stop-and-go at first as he familiarizes himself with the pacing, accidentally directing Toothless into rocky columns along the way. But as the two gain confidence, Hiccup encourages Toothless to fly as high as he can. When they reach peak altitude, Hiccup loses his cheat sheet and they plummet without the proper change in tail fin position. After a moment of panic, Hiccup grabs the cheat sheet and clips back into the saddle. The wind prevents him from reattaching the cheat sheet and he is forced to rely on instinct and memory to engage the proper tail fin position to keep them from hitting the water. He does so in the nick of time and they successfully navigate through the maze of rocky columns. They emerge triumphant: Hiccup raises his arms and cheers; Toothless spits a ball of fire they fly into, scorching Hiccup’s hair.

The general trajectory of alignment in “Test Drive” is downward (Figure 6.13). While Hiccup and Toothless start in synchronicity, the decline in congruence between score and film relates to the rocky journey that lies not only immediately ahead, but into the future as they face obstacles with the village, Hiccup’s training, and defeating the Red Death.
Alignment is relatively stable in the first third of the scene. Hiccup succeeded in constructing the saddle and tail fin contraption and the two are optimistic about flying together. This section (mm.1-21) concludes with a successful first dive towards the water and coincides with a new musical phrase at m.21. A spike in alignment at m.22 accompanies the leveling off as Hiccup and Toothless fly over the surface of the water (Figures 6.14a-g). Confidence and relief are evident in the triumphant tone in the music (a new phrase with fuller orchestration) and its rhythmic unity with visuals and sound effects. This increase in alignment continues through
m.29, at which point they begin to navigate around the rocky pillars. They run into several, and the misalignment with music imitates the interference in the flying experience.

Figure 6.14a: Storyboard score for “Test Drive,” m.22
Figure 6.14b: Storyboard score for “Test Drive,” m.23
Figure 6.14c: Storyboard score for “Test Drive,” m.24
Figure 6.14d: Storyboard score for “Test Drive,” m.25-26
Figure 6.14e: Storyboard score for “Test Drive,” m.27
Figure 6.14f: Storyboard score for “Test Drive,” m.28
From there, the graph descends. Over-confident, Hiccup directs Toothless to fly higher. The wind at the high altitude blows the cheat sheet out from the saddle in m.39, coinciding with a sharp decrease in alignment. The subsequent increase in alignment follows Hiccup’s recapturing of the paper and his first attempts to guide Toothless out of the free fall (Figure 6.15a-b).
Figure 6.15a: Storyboard score for “Test Drive,” m.42
After this point, the score and filmic elements diverge, mimicking the chaos of the fall and Hiccup’s doubt in his ability to control the tail fin without the cheat sheet. Alignment returns briefly at mm.53, 65, and 69. The first peak at m.53 corresponds to Hiccup successfully clipping into the saddle (Figure 6.16). They continue to fall, but Hiccup is able to stop Toothless’s spinning.
The swell at m.65 accompanies Hiccup and Toothless’s emergence from the stone pillar labyrinth and surrounding mist (Figure 6.17). Seemingly, the danger is over, though the continued rhythmic dissonance between music and action suggests there is more to come.
The last increase in the alignment graph occurs at m.69. This corresponds to Hiccup’s cheer and Toothless spitting a celebratory fireball (Figure 6.18).

Figure 6.17: Storyboard score for “Test Drive,” m.65
Musical-filmic alignment declines over the course of the scene. This relationship mirrors the trajectory of the narrative. Hiccup and Toothless’s first flight is successful, but ends unsynchronized as the film has yet to reach its final climax and resolution. High alignment at the beginning reflects Hiccup’s over-confidence, whereas the lower, stable section at the end indicates more realistic expectations.

6.4 CONCLUSIONS
In “Forbidden Friendship,” Hiccup learns how to train a dragon; in reality, he is training himself as much as the dragon. The two learn how to effectively communicate with each other so that Hiccup might understand the ways Toothless wants to be respected. By the point in the movie described in “Test Flight,” above, the pair communicates easily, but do not readily grasp their limitations. When they are truly tested in the free-fall, Hiccup places responsibility on Toothless first and then doubts himself when he is unable to read the cheat sheet. It is through his command of the situation (re-harnessing himself) and forced confidence (relying on his memory for pedal positions) that the two succeed. Again, Hiccup must trust in his own training to lead Toothless. The rhythmic interaction between filmic and musical elements supports this underlying narrative: alignment trajectories accentuate Hiccup’s understanding of Toothless and understanding of self. Synchretic analysis reveals that although on the surface Hiccup learns to appease dragons, the film’s fundamental message focuses on learning to train oneself to empathize with those different from us and find strength in one’s uniqueness.
CHAPTER 7: Psycho

7.1 INTRODUCTION

Synchretic analysis via Storyboard Scores has thus far extended only to animated films, but is not limited to that medium. Although Storyboard Scores can be thought of as an outgrowth of animation storyboards, it returns information about rhythmic interaction between music and visuals – a relationship interesting in both animated and live action films.

Alfred Hitchcock’s work is a natural extension of synchretic analysis because of his painstaking planning of every sequence of film in the format of storyboards. Although he did not intend for the murder scene to have music, the careful attention to the pacing and rhythm inherent in the visual action set a blueprint for the musical meter added later.48

Of all the films studied for this dissertation, Alfred Hitchcock’s Psycho (1960) is by far the most renowned in the literature of cinema, in part because of Bernard Herrmann’s score. The American Film Institute ranks Psycho as the fourteenth greatest American film49 and its score as the fourth greatest of all time.50 The shower murder scene is one of the most iconic scenes in the history of cinema.

Psycho is Hitchcock and Herrmann’s seventh collaboration, having previously worked together on The Trouble with Harry (1955), The Man Who Knew Too Much (1956), The Wrong Man (1956), Vertigo (1958), and North by Northwest (1959). The score is notable for its reduced


orchestration to string orchestra intended to emulate the restricted tonal colors onscreen – the film itself is black and white. The composer confirmed in an interview that he “complement[ed] the black and white photography of the film with a black and white sound.” Additionally, the absence of diegetic music heightens the dramatic impact of the non-diegetic score, which ultimately signals the “irrational.”

Past research on this infamous score focuses greatly on the melodic, harmonic and orchestration elements of the music. The emotional subtext of the music and its impact on the film have been discussed at length in conjunction with the nuances in the narrative. The following analysis builds on this concept through the close tracking of the musical-visual alignment from “The Peephole” through “The Murder.”

The film begins with a young secretary, Marion stealing a large sum of money from her employer in order to run away with her boyfriend. She skips town, trades in her car, and drives along back roads to avoid the police. Exhausted from the drive, she stops in the Bates Motel for a night of rest. There, she meets Norman Bates, a young man who runs the motel and cares for his mentally ill mother. During her stay, Marion decides to return home and return the money. While she undresses for a shower, Norman watches her through a concealed peephole in the parlor. Marion steps into the shower and the running water obscures the sound of Mrs. Bates entering the bathroom. Mrs. Bates murders Marion with a large knife and flees the scene. Norman, horrified at his mother’s actions, removes all traces of Marion’s presence, putting her body inside her car and sinking it in a nearby swamp.

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Marion’s disappearance concerns her sister Lilah and a private investigator hired by Marion’s employer. They search for her in nearby motels near Marion’s boyfriend’s hometown of Phoenix. During an inspection of the Bates Motel, the two discover that “Mother” is dead (her body is kept in the basement) and Norman has dressed in her clothes to commit multiple murders of young women. In the final scene, a judge hears Norman’s lawyer explain that he is afflicted by schizophrenia, and that Norman became “Mother” out of guilt after he poisoned her and her lover. He preserved her body, like the stuffed birds on the wall of the parlor, but wore her clothes and carried on conversations with himself. The same jealousy that drove him to kill her fuels “Mother’s” jealousy of the young women who stay in the motel and capture Norman’s attention.

7. 2 SCENE SYNOPSIS

The first sequence begins with Norman removing a painting from the wall to reveal a peephole through which he watches Marion undress in her room (Section 7.3\textsuperscript{53}). He returns the painting to the wall, walks to the main house, and stops at the bottom of the staircase. After a bit of contemplation, he steps away from the staircase and instead heads for the kitchen. His movements are alternatively decisive and hesitating as he battles with lust and jealousy, and the impulse to become “Mother” and murder Marion.

Meanwhile, Marion removes her clothes and dons a bathrobe. She accounts for the remaining money and what she owes in restitution. Although initially confident in her desire to right the wrong committed, she tears the paper into tiny pieces and flushes it down the toilet.

\textsuperscript{53} For the purposes of this analysis, the scene has been split into two sections according to cue, “The Peephole” and “The Murder.” The intervening un-scored time is long enough (roughly one minute) that the extending power of the previous meter is insubstantial.
Marion showers blissfully, oblivious to the outside world. The door to the bathroom opens and the silhouette of an older woman (“Mother”/Norman) walks towards the shower, her footsteps obscured by the sound of falling water. Mother pulls the shower curtain back revealing a wielded knife. The extremely vulnerable Marion –caught both unaware and unclothed– screams as Mother stabs her repeatedly (Section 7.4). Mother flees quickly as Marion gasps for breath. Marion slides down the wall of the shower, grabs the shower curtain, and pulls it down as she collapses with her final breath.

7.3 ANALYSIS: PART 1 – BEFORE THE MURDER (“THE PEEPHOLE”)

![Image](image.png)

Figure 7.1: Alignment throughout “The Peephole”
The first peak in alignment occurs in measures 16-20. It highlights Norman’s surrender to lust as he watches Marion undress (Figures 7.2a-c). Misalignment in measures 14-15 and 21-22 frame Norman’s voyeuristic act, highlighting the importance of the moment: it fuels Norman’s lust and Mother’s resulting jealousy.

Figure 7.2a: Storyboard score for “The Peephole,” mm.15-16
Figure 7.2b: Storyboard score for “The Peephole,” mm.17-18
Figure 7.2c: Storyboard score for “The Peephole,” mm.19-22

Norman backs away from the peephole. His hesitation is evident from his slow movement. He returns the painting to the wall, and it appears that he will not invade Marion’s privacy anymore (Figure 7.3). At first, he seems ashamed of his actions, but the high alignment suggests an internal struggle with “Mother.” The incessant march of the ostinato in the strings alludes to Mother’s persona lurking within Norman.
Upon exiting the motel, Norman stops walking then turns his head quickly to look at something (the house) off-screen (Figure 7.4). The fast turning of his head, paired with a quick camera movement is the first visual signal of danger: Norman is not just the timid young man with a curiosity for women. Moreover, it suggests that something sinister lies in the direction in which he is looking. In this case as we come to learn by the end of the movie, the house is not only where Mother’s body is kept, but also where the transformation from Norman to Mother
takes place. In this way, the house represents Mother as it overlooks the goings-on of the motel below it.

Figure 7.4: Storyboard score for “The Peephole,” mm.31-32

The last peaks in this sequence accompany Norman’s hesitation at the bottom of the staircase (Figures 7.5 and 7.6.) Like his hesitation in the parlor, Norman struggles against Mother, who has drawn him into the house, and is luring him upstairs. But Norman prevails, and steps away from the staircase. The misalignment suggests that he has quelled Mother’s voice. It is confirmed a few bars later when the cue comes to a close and the ostinato pattern ceases. The
score then signals safety as Norman walks into the kitchen more casually and sits at the table.

The fast-moving, hawk-eyed man who exited the motel is gone.

Figure 7.5a: Storyboard score for “The Peephole,” m.37
Figure 7.5b: Storyboard score for “The Peephole,” mm. 39-41

7.4 ANALYSIS: PART 2 – “THE MURDER”

Alignment is sporadic throughout the scene, supporting the chaos and upset the murder causes (Figure 7.7). This is, after all, a huge turning point in the film from intrigue to horror. The misalignment, then, keeps the audience feeling untethered thus heightening the terror factor.
Although the screeching glissandi capture the aesthetic of Mother’s stabs well, they do not align to the action. A sense of alignment does not appear in this cue until measure 16, at which point Mother flees the scene; she is victorious over both Norman and Marion (Figure 7.8). The peak in alignment in measure 18 accompanies signs of life as Marion moves. Like Norman’s hesitation earlier, Marion doesn’t immediately succumb to Mother.
Figure 7.8: Storyboard score for “The Murder,” mm.15-18

Marion turns away from the shower wall, a laborious movement considering her wounds, but a sign of her resistance (Figure 7.9).
Once Marion stops at the bottom of the shower, all alignment ceases. Although she still breathes, she reaches a resting position on the ground (Figure 7.10a). The misalignment indicates her defeat ahead of her final breath. Marion’s final act, to pull the shower curtain down is an attempt to reclaim her modesty following the intrusion when she is at her most vulnerable (Figure 7.10b). The alternating sforzando and low notes parallel the slowing of her breath and heart before the pops of the shower curtain rings punctuate her death.
Figure 7.10a: Storyboard score for “The Murder,” mm.26-31
7.5: CONCLUSIONS

Alignment between music and action across the two scenes support the transition between the focus on Marion to focus on Norman. They mark a pivotal point in the narrative where film analysts identify a transition from the first part of the movie (centered on Marion) to the second part of the movie (centered on Norman). The alignment in “The Peephole” marks the beginning of the transition, with notable synchonony when Norman watches Marion undress.

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“Mother,” present in Norman’s hesitation and change in disposition, furthers the transition along, but disrupts the musico-visual synchrony. By the time of the murder, the focus has seemingly returned to Marion as she showers. However, the alignment during Mother’s retreat and diminishing alignment during Marion’s final breaths signal the completion of the transition: the film is no longer about a young woman on the run with stolen money, but about a young man with “schizophrenia.”

55 Although the psychiatrist at the end of the film diagnoses Norman with schizophrenia, advancements in mental health classification and later publications of the Diagnostic and Statistical Manual of Mental Disorders (DSM) supports the notion that he was instead afflicted by dissociative identity disorders, see Kajal Shah, “Dissociative Identity Disorder in Psycho,” *The Odyssey Online* (October 10, 2016), accessed May 14, 2017, http://www.theodysseyonline.com/dissociative-identity-disorder-psycho.
CHAPTER 8: CONCLUSIONS

Film music is created for the purpose of enhancing what takes place onscreen. Whereas traditional film music scholarship describes the history of the score’s composition, analysis of the music in isolation (through Roman and Arabic numerals, for instance), or describes the broad strokes of dialogue of text and subtext within film music synchretic analysis via storyboard scores provides a set of techniques for analyzing how the music and action work together, charted against time as the common denominator.

The storyboard score is an outgrowth of many sources: storyboards used in pre-production, Ron Sadoff’s Musical and Visual Syntax graphs, and Sergei Eisenstein’s diagrams with Prokofiev’s music. However, it goes beyond what any one of these methods achieves in the microanalysis of frame-by-frame musical-visual synchresis. Digging into the minutia of synchronicity in these films (taking into account all aspects of film: action, editing, dialogue, sound effects, and music) reveals narratives and relationships that would otherwise go unnoticed.

Overall, synchretic analysis helps to answer the question posed at the beginning of the dissertation: What is the temporal relationship between visual action and music? Music and action influence each other through the imposition of meter and rhythm. The synchrony and asynchrony between the imposed meter reveal deep background narratives that contribute to the ethos of each film.

Seeing when the music and action align provides an understanding of how the music may be interpreted as an active storyteller. The storyboard score itself works best to chronicle the microalignments, while the line graphs of tension and alignment give a better overall view of the
musical-visual pacing over a longer period. Its employment allows for deeper analysis of the functional relationship between scores and film.

The implementation of this system to analyze *Bambi*, *The Lion King*, *WALL-E*, *How To Train Your Dragon*, and *Psycho* led to a range of discoveries. The range of style in scoring, editing, and narrative required tailoring in the interpretation of the data, but ultimately yielded noteworthy insight into a background narrative unapparent to the naked eye and ear. In *Bambi*, musical-visual congruence coincides when characters are in tune with nature, while sections of misalignment accompany the presence of danger or a lack of synchrony with the natural surroundings. The storyboard score shows the continuation of the previous musical tempo as Bambi comes to terms with Mother’s death. In *The Lion King*, separate character graphs reveal that Simba’s maturation and hero’s journey is more dynamic than his mentors Mufasa and Rafiki, who have already achieved self-awareness. Peaks in alignment coincide with Simba’s gradual understanding of his purpose and place in the circle of life. For Mufasa and Rafiki, high alignment corresponds to moments in which they offer guidance and mentorship to Simba. In *WALL-E*, dance-like rhythms in the action line of the storyboard score further emphasize the theme of dance throughout the film as a symbol of romantic love. WALL-E’s kiss and subsequent dance with EVE disrupts the routine aboard the Axiom and reminds Mary and John of physical contact in a disconnected society of passivity and self-indulgence. In *How To Train Your Dragon*, alignment highlights moments when Hiccup and Toothless work and communicate successfully, while misalignment underlies moments of miscommunication. Synchronicity when Hiccup and Toothless understand each other, and when Hiccup has confidence in himself, demonstrate that respect and conviction are key elements in developing the desired cooperative relationship between boy and dragon. In *Psycho*, synchretic analysis helps demonstrate how
Mother as a “hidden” character within Norman conflicts with Norman’s own psyche, as he battles emotions of lust and jealousy upon meeting Marion. The alignment trajectory in moments when Mother prevails prepares the film for the transition between focusing on Marion to Norman.

The analysis of individual films generated refinements in the process of synchretic analysis. For *Bambi*, frames aligned to periods of silence in “Winter” required the creation of the blue box category of classification. When alignment graphs looked flat and unremarkable in *The Lion King*, separating each character’s actions revealed dynamic graphs that better suited Simba’s evolving outlook on life. Additionally, the realization that rhythm in dialogue and sound effects could affect the perceived filmic rhythm influenced the decision to collect timings for each syllable in the analysis of this film. Dance-like rhythms in *WALL-E* prompted closer analysis of the action line in the storyboard score. Over-inflated graphs in *How To Train Your Dragon* stimulated discussion of quantization level, which in turn led to further research into questions of audio-visual temporal perception window in the data analysis. Each improvement to the analytical process enhanced the accuracy of the storyboard score, culminating in a more polished system used for *Psycho*. The tailoring at each step exhibits the flexibility of the storyboard score and its value in analysis for a broad range of films, in style, genre, and medium (animation and live-action).

Overall, synchretic analysis helps to answer the question posed at the beginning of the dissertation: *What is the temporal relationship between visual action and music?* Music and action influence each other through the imposition of meter and rhythm. The synchrony and asynchrony between the imposed meter reveal deep background narratives that contribute to the ethos of each film.
Moving forward, I anticipate analyzing a single film in its entirety to give a clearer pictures of the importance of musical-visual alignment, with the hope that the results found in isolated scenes hold up against the rest of the movie. Analysis of films created to music, such as *Fantasia* (1940) is also an area of interest. Some of the films of Hayao Miyazaki are also intriguing as they underwent rescoring with a new composer for the American release; comparison of the two releases could reveal interestingly divergent narrative trends.

Discussions with both film and music editors will uncover the purposefulness or coincidence of the close relationship between auditory and visual elements and its power to influence the subtext of the film. Edits to the recorded material (evident from discrepancies between the final notated score and the film audio) are indicative of the power that editors may have as much a hand in synchronesis as the composers, animators, and directors.

In a more practical capacity, in my own film music compositions, I intend to implement a “reverse storyboard score,” that would inform my decisions in composing to film. This would require a mostly – if not totally – completed film (i.e. not an animatic or a rough cut) in order to identify every small movement and film element ahead of composing. I imagine it will lead to interesting observations about the hierarchy of film elements: which is the most important to highlight? How does the simplification of rhythmic activity in order to make room for the dialogue and sound effects affect my synchronization choices? I also believe it will influence the way I write music, posing other questions: If I had not gone through this process, how might the score differ? Does the film benefit from a highly-calculated alignment scheme? My educated guess, based on the research conducted, is that yes, the film as a whole would benefit from dynamic alignment and misalignment. The purposeful construction of these relationships will
produce a score that feels entirely seamless and integrated into the narrative, as opposed to a product solely of post-production.
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The Nightingale
for narrator and orchestra

Jennifer Dirkes

2017
PROGRAM NOTES

_The Nightingale_ is a three-act concert work for orchestra and narrator, with text based on the fairytale by Hans Christian Andersen. Although not set to picture, I imagine it could be after the fact, much like Prokofiev’s _Peter and the Wolf_. For now, musical elements represent different facets of the story including setting, characters, and situations. In the first act, metallic percussion sets the scene of the grand porcelain palace. A downward moving melody signals an entering into the dense forest. Pizzicato strings characterize the advisor and court’s walking through the palace and into the forest. Piccolo (the Nightingale), oboe/horn (the Emperor), contrabass, bassoon, oboe/English horn (forest creatures) replace traditional dialogue, while the Narrator filling in the gaps. Act II is sparser in orchestration favoring a chamber ensemble sound as the mechanical bird (celesta) arrives at the palace. In Act III, a Chinese Dagu drum represents Death as the Emperor’s health declines. The instrumentation of the Nightingale extends in the second and third acts, revealing that she offers more than just entertainment; she can sing Death away, she can heal the Emperor’s illness, and she can inform him of the happenings in and around the empire, as his court is untrustworthy and disconnected from the country.

NOTE TO THE CONDUCTOR

Overall volume of the ensemble should be lowered as necessary to allow clarity for the narrator speaking parts.

NOTE TO THE NARRATOR

Lines should be started as close to the notated entrances as possible. The text has been adjusted so that it extends across just enough measures for the appropriate speaking duration. Amplification in performance is permissible and encouraged.
INSTRUMENTATION

PICCOLO/FLUTE
FLUTE
OBOE
OBOE/ENGLISH HORN
CLARINET (2)
BASSOON (2)

HORN (2)
TRUMPET (2)
TROMBONE
BASS TROMBONE

PERCUSSION (5)
  BASS DRUM
  CROTALES
  DAGU DRUM
  FLOWER POTS (HIGH/LOW)
  GLOCKENSPIEL
  HAMMERED DULCIMER
  SLEIGH BELLS
  SNARE
  SUSPENDED CYMBAL
  TUBULAR BELLS
  VIBRAPHONE
  WOOD BLOCK

HARP (2)
CELESTA/PIANO

VIOLIN I, II
VIOLA
VIOLONCELLO
CONTRABASS
The Nightingale
Act I

Magical \( \frac{3}{4} = 80 \)

Many years ago, the Emperor of China lived in a palace made completely of delicate porcelain.

The garden had the most wonderful flowers with silver bells tied to them that tinkled when one walked through.

Narrator

The garden had the most wonderful flowers with silver bells tied to them that tinkled when one walked through.
It extended so far, the gardener himself did not know the end of it!
But at the end stood a forest with tall trees.
And there lived a Nightingale, who sang most beautifully.
Traveling scholars and poets wrote many books about the palace and garden, but the Nightingale especially. Their books spread around the globe, and eventually reached all the way back to the Emperor.
"WHAT?!

"I know of no Nightingale! Is there such a bird in my empire?"

So he sent his Adviser to ask after the creature.

The Adviser went up and down the stairs,

""
through the halls and corridors, but no one in court had heard of the Nightingale.
Narr. Fl. 1
Fl. 2
Ob. 1
Ob. 2
Cl. 1
Cl. 2
Bsn. 1
Bsn. 2
B. Tbn.
Vln. I
Vln. II
Vla.
Vc.
Cb.
Glock.
Hp. 1
Hp. 2

At last he met a poor Little Girl in the kitchen. She said, "The Nightingale!"

"I know it well. Her song is so sweet, it's as if my mother kissed me!"

So the Little Girl led him to the forest where the Nightingale lived. Half the court went along.

Slow \( \text{= 70} \)

Andante \( \text{= 100} \)
As they walked, a cow began lowing.

"Oh!" said the Royal Shipman.  "You must leave us!"

"No," said the Little Girl.  "We heard a cow lowing."

"It's just a cow lowing."

"No," said the Little Girl.  "It's a cow lowing."

[Music notation]
"Nightingale, our gracious Emperor wishes you to sing before him at the palace!"

"Oh, my song is better in the forest!" said the Nightingale.

But she came willingly, wanting to please the Emperor.
Narr.  
The palace was splendidly decorated! The porcelain walls and floor gleamed in a thousand lamps. The loveliest flowers with the silver bells lined the aisles.  

Glock.  

Crot.  

Fl. Pots  

Hp. 1  

Hp. 2  

A golden perch was placed next to the Emperor for the Nightingale.
Everyone gathered and looked to the little gray bird when the Emperor added.
The Nightingale sang so sweetly that the Emperor was moved to tears. The tears rolled down his cheeks as her song became still more touching. He was so delighted that he declared her the High Imperial Singer!

"I've seen tears in the eyes of the Emperor!" the Nightingale said. "I have been rewarded enough. But she was kept at court in a cage, and was made to sing for the Emperor."
One day, a package arrived at the palace.

Inside was a small mechanical bird covered all over with diamonds, rubies and sapphires.

As soon as it was wound up, it sang a song.
The mechanical bird was made to sing a duet with the real Nightingale. But the Nightingale's song changed each time, while the artificial bird repeated the same. So they had the artificial bird sing alone. It pleased the Emperor as much as the Nightingale had and was much prettier to look at.
The mechanical bird sang its song thirty-three times without tiring. Everyone would gladly have heard it again, but the Emperor wanted the Nightingale to sing some. No one noticed that she had flown out the open window and back to her forest.

"Why did she leave?" said the Emperor. All the courtiers thought that she was a very ungrateful creature and should be banished from the empire.

Slow $\text{\( \downarrow \) } = 50$

Bright $\text{\( \downarrow \) } = 80$

All the courtiers thought that she was a very ungrateful creature and should be banished from the empire.
The mechanical bird was given a place on a cushion close to the emperor's bed and named "High Imperial Singer."

Thus went a whole year. The Emperor, the court, and all the people knew every little turn in the bird's song and for that same reason it pleased them better for they could sing along.
But one evening, it broke down.

The Emperor sent for a watchmaker.

The watchmaker repaired the bird, but said that the mechanical parts were too worn to play music.
Dirge $\frac{4}{4} = 60$

Now, five years passed and a great sadness befell the country because the Emperor became ill and expired.

Cold and pale lay the Emperor. His court knew he was almost dead and left him alone in his room with only the broken mechanical bird. The moon shone upon the Emperor and the bird through an open window.

Act III
The Emperor could hardly breathe! It was as if there were something heavy on his chest. He opened his eyes and saw that it was Death who sat on his chest.

But the bird stood still.

Death looked at the Emperor with his great hollow eyes and was quiet.

Fearfully quiet.

Then the loveliest song sounded through the window; it was the Nightingale, who sat on the branch outside.
She had heard of the Emperor's illness and was there to sing to him of comfort and hope.

As she sang, the Emperor began to regain his strength.

She heard of the Emperor's illness and was there to sing to him of comfort and hope.

As she sang, the Emperor began to regain his strength.
Even Death himself listened and said, "Keep singing little Nightingale!"
The song reminded Death of the quiet churchyard, where the white roses grow, where the elder tree smells, and the fresh, sweet grass is moistened by living tears.
Death yearned for his garden and floated like a cold, white mist out of the window.

"Thank you, thank you!"
said the Emperor.

"I banished you from my kingdom and yet you have
banished Death! How can I reward you?"

"You have already rewarded me," she said. "I drew tears from your eyes the first time I sang for you."
"But now sleep and grow strong and well. I'll sing for you."

Her song made the Emperor fall into a sweet sleep. He awoke, strengthened and restored. None of his servants had returned, for they thought he was dead, but the Nightingale still sat and sang.
"You must always be with me," said the Emperor.
"I cannot live in the castle, but let me come when I want. I will sing of the happy and those who suffer. I will sing of good and evil in your court and your empire each evening." And the Nightingale flew away.
The servants came in to look after the body of the Emperor. But he was well! He said nothing of the Nightingale, but relied on her to sing him the sweet music of the outside world as he continued to rule his empire.
The Twins
The Twins

Picc.

Cl.

Cl.

B. Cl.

Cym.

Vib./Bowls

Vln. I

Vln. II

Vla.

Vc.

Cb.
April
Score for the film by Ann Tmangraksat

Jennifer Dirkes
April

Bittersweet $\frac{d}{d} = 70$

Melancholy $\frac{d}{d} = 74$

Pushing forward $\frac{d}{d} = 80$
April

228