Developing a Mathematically Informed Approach to Musical Narrative through the Analysis of Three Twentieth-Century Monophonic Woodwind Works

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DEVELOPING A MATHEMATICALLY INFORMED APPROACH TO MUSICAL NARRATIVE THROUGH THE ANALYSIS OF THREE TWENTIETH-CENTURY MONOPHONIC WOODWIND WORKS

A Dissertation

Submitted to the Graduate Faculty of the Louisiana State University and Agricultural and Mechanical College in partial fulfillment of the requirements for the degree of Doctor of Philosophy

in

The School of Music

by

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ABSTRACT

This project applies mathematically informed narrative to monophonic music in the twentieth century, with a focus on three works for solo woodwinds: Debussy’s *Syrinx* (flute), Stravinsky’s *Three Pieces for Clarinet*, and Britten’s “Bacchus” from *Six Metamorphoses after Ovid*, Op. 49 (oboe). This music poses difficulties for traditional analytical methods due to a lack of explicit harmonies and unusual pitch language that is neither functionally tonal nor serially atonal. Additionally, these pieces present a variety of challenges due to differences in length, number of movements, and presence or absence of programmatic elements. Therefore, nontraditional methods could be beneficial for understanding these idiosyncratic pieces. Mathematical and transformational approaches have shown that such descriptions can elegantly illustrate pitch language in a wide variety of tonal and atonal styles. Visual transformational and geometric approaches, such as oriented networks and graphic representations, can assist in illustrating important changes that take place during a piece.

Narrative theory approaches analysis from another viewpoint. While not all music can be considered narrative, a narrative paradigm is applicable to a wide range of musical styles. Because narrative theories focus on large-scale topical and gestural changes for building interpretations, it complements the locally focused nature of transformational theory. Together, a mathematically informed narrative method can reveal connections that are not immediately obvious in these works, and help a listener or performer create an informed interpretation.
CHAPTER 1. METHODOLOGY AND LITERATURE REVIEW

I. Introduction

The analysis of music generally begins with the goal of attaining a clearer understanding of the music in question. As Steven Rings states, analysis can “focus one’s hearing of a piece or passage, making available a sharpness of perception where previous experience may only have been vague or inchoate.”¹ Despite the common goal of clarity, musical analysis manifests in a variety of ways, each with its own strengths and weaknesses. Music theory often forges interdisciplinary links between music and subjects such as language, literature, and mathematics. Guerino Mazzola suggests that music’s interdisciplinary nature comes from the various activities associated with music itself, which he describes as perception, production, communication, and documentation.² Further, Mazzola suggests four specific scientific domains that interact while describing the field of music: psychology, mathematics, semiotics, and physics.³ Mazzola explores the complex interactions between these four domains in an attempt to “unite philosophical insight with mathematical explicitness.”⁴ This document, while significantly less comprehensive than Mazzola’s work, strives for the same goal of synthesis between different branches of music theory, specifically narrative theory (which touches on both psychology and semiotics) and transformational theory (derived from mathematical principles).

Music-theoretical works often encourage eclectic methods, but for practical reasons they often focus on a single analytical technique. This study brings together two rich and

³ Ibid., 6–8.
diverse perspectives in order to suggest ways in which music might be heard and performed. Narrative approaches build long-range interpretations through a focus on value changes expressed through topical and gestural shifts. Conversely, transformational techniques usually illustrate local connections between motives, rhythms, and harmonies. By combining the interpretive perspective of narrative with the precision of transformational descriptions, I highlight musical connections that may not be immediately obvious, but can help a listener or performer create a convincing and consistent interpretation.

To concisely illustrate the intersections between these theoretical approaches, I have limited the scope of the study to a repertoire consisting of monophonic woodwind works from the twentieth century, specifically, Debussy’s *Syrinx* (flute), Stravinsky’s *Three Pieces for Clarinet*, and “Bacchus” from Britten’s *Six Metamorphoses after Ovid*, Op. 49 (oboe). These pieces are analytically pertinent in part because they lack explicit harmonies and use unusual pitch language that is neither functionally tonal nor serially atonal. Robert Orledge suggests, “a perfect, self-contained monody is perhaps the most challenging of all compositions,” and goes on to note that Debussy’s *Syrinx* has “a special fascination for contemporary analysts.” Additionally, these pieces present a variety of analytical opportunities due to differences in length, number of movements, and presence or absence of programmatic elements. The overall brevity of each piece favors thorough analysis that allows for close examination of transformational details as well as comprehensive overviews in a narrative style.

This chapter explores theoretical concepts behind musical narrative and transformational theory separately before detailing techniques of synthesis used in the

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following analytical chapters. I first consider narrative theory and define musical narrative through three core elements distilled from the literature on narrative. After discussing concepts relevant to narrative theory, I turn to the tools of transformational theory that I use to inform my analyses. After laying the groundwork for each method, I offer specific examples to illustrate the dialogic relationship between mathematics and narrative in musical analysis.

II. Theoretical Concepts

Narrative Theory

In order to use a theory of musical narrative, I first define narrative for the purposes of this document, and then consider how that definition might apply to music. As Michael Klein has stated, “there is no shortage of definitions for narrative nor of scholars who find each one inadequate.”

Most definitions of narrative agree that it is a basic human interpretive act. Narrative is capable of referring to external objects or events (even imaginary or abstract ones), projects a temporal structure, and uses consistent patterns or archetypes. I suggest that music is a medium that can fulfill these three basic roles, and that narrative interpretations of music can be both relevant and consistent.

Humans tell stories. From the time of ancient legends through modern movie blockbusters, organizing information into a story, or narrative, has been a widely practiced human activity. János László notes the “narrative nature of all human knowledge.” The narrative impulse is strong partially because organizing events into a narrative can be a tool

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“for integrating practical experience in life and creating coherence.”8 As Lawrence Kramer has stated, “narrative is grounded in a demand or desire to tell something, and it cannot be budged from that ground” (emphasis in the original).9 Whether oral, visual, or aural, human interaction often occurs in a narrative format. László discusses narrative features that appear in the fields of history and the social sciences.10 Vincent Meelberg also notes the universality of narrative, and claims, “narrative can be regarded as a means to make sense of the world, to structure the human subject’s experiences and to integrate these into a graspable whole.”11 Despite narrative’s ubiquitous nature, some have accused music of being incapable of narrative.12 However, recent research has suggested a variety of ways that music can function within this common form of human expression.13 The most central aspects of narrative – referentiality, temporal structure, and patterns or archetypes – are clearly present in a wide variety of music.

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8 Ibid., 10.
László defines narrative as “a text that refers, or appears to refer, to a set of events outside itself.” However, the reference is not always clear in any narrative medium, because “narrative always creates its own ‘reality,’ the thing that it refers to.” This ordering and organizing of events creates a plot or story, whether the events recorded are fiction or non-fiction. According to Vincent Meelberg, narrative “functions as an account with which the human subject can make the events s/he undergoes discursive, i.e. to turn them into experiences.” These experiences or events provide meaning in a narrative, making the ability to refer to outside events a primary element of narrative.

Music’s inability to refer to specific events without recourse to text or program has been a difficulty for proponents of musical narrative. However, music creates its own realities in several ways. At its height, tonality created ready references to narrative events, through conventions such as cadences and formal structures. Nicholas Reyland suggests that tonal music has a “fundamentally plot-like aspect,” in its “presentation of sequences of events implying causation, teleology, and a marked degree of change over time.” Susan McClary has specified that the plot of many tonal works is a reflection of the mythic hero quest. Additionally, James Hepokoski and Warren Darcy’s *Elements of Sonata Theory* uses plot-like devices when describing the functions of events in Classical sonatas.

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15 Ibid., 12.
Fortunately, despite the convenience of tonal devices, “tonality alone is not narrative.”\textsuperscript{20} Other aspects of music can provide the necessary referential function including topic, genre, phrase shape, or other patterns.\textsuperscript{21} Rebecca Leydon even posits, “the surge of secondary parameters in post-tonal music could serve as a means of liberating musical narrativity from the strictures of common-practice processes…[secondary parameters] can act as narrative triggers.”\textsuperscript{22} Byron Almén’s narrative theory deals primarily with tonal music, but focuses on the transvaluation of musical elements beyond simple tonal schemas, encouraging culturally aware interpretations. Klein also emphasizes music’s cultural role, suggesting that “the master signifiers of a culture do not function to pin down musical stories; rather…they reorganize music’s signifiers toward what really matters.”\textsuperscript{23}

Understanding music’s referentiality is a hermeneutic act, allowing us to view texts as “a field of humanly significant actions.”\textsuperscript{24} Kramer calls striking features that help the text to refer to something outside of itself hermeneutic windows. These windows vary from piece to piece, and can suggest a piece’s own unique story or link to the stories of other texts. In later chapters, I will explore various ways in which twentieth-century monophonic woodwind works exhibit referentiality, including references to narrative archetypes, programs, and their own unique realities.

\textsuperscript{20} Klein, “Musical Story,” 16.
\textsuperscript{21} Some of these ideas are explored in Klein, “Musical Story”; and Meelberg, \textit{New Sounds, New Stories}.
\textsuperscript{23} Klein, “Musical Story,” 19.
Regardless of medium, narratives must also have a temporal structure. It is not enough to have a series of events. Those events must also be organized into a specific sequence in order to create a narrative. This organization creates the distinction between story (chronological events in the constructed world) and discourse (ordering of events in the performed narrative), as described by Micznik. The temporal nature of narrative acts in conjunction with its referentiality, so that, “a narrative is the representation of a temporal development.” Narrative discourse often closely mirrors the story, but the narrative is only a representation of the events. The discourse arranges the events into “narrative nodes,” that establish the chronology and are the “backbone of narrative.” László points out that “the time of a narrated event and narrative time do not coincide…narratives may delay or speed up the process that leads to the outcome of the plot.”

Events can be arranged in a variety of ways, juxtaposing the chronological order of events and the order in which they are presented to the listener or audience. According to Reyland, this discontinuity is central to plot and story because, “stories are disunity over time.” The ordering of events in a discourse can increase tension and create suspension, helping to convey the story to a listener.

Temporality is an important aspect of musical narrative, partially because a musical performance has time-specific elements such as rhythm and tempo. Time and its perception in music is a well-studied topic, with Jonathan Kramer’s 1988 work The Time of Music: New Meanings, New Temporalities, New Listening Strategies serving as a focal point for much of

26 Meelberg, New Sounds, New Stories, 39.
28 Ibid.
29 Reyland, “Negation and Negotiation,” 32.
the discussion. In his work, Kramer presents several categories of time oriented to a continuum that spans from linear (processive) to non-linear (non-processive). While these categories can be used effectively in analysis, Almén and Hatten have explored expansions of Kramer’s categories of time, providing eighteen different temporal techniques used in the twentieth century. Other authors have criticized Kramer’s method, asserting, “Kramer’s text opens new possibilities while serving as an example of the way not to go.” In another text, Klein provides an alternate temporal dichotomy using narrative and lyric time in his analysis of Chopin’s Fourth Ballade. In this context, narrative time is progressive while lyric time is static. Similarly, Meelberg discusses tense, stating, “the past is considered as being non-progressive, and therefore represented by non-progressive music…whereas the present equals progression and therefore is represented by music that is harmonically complex.” Raymond Monelle specifically suggests a tension between syntax and semantics in Kramer’s work, asserting, “Kramer’s formal concerns, however, are with…the ordinary components of musical time. His failure to identify these as chiefly syntactic features, not necessarily linked to any semantic level, hampers him in analyzing older music.”

Kramer’s study is focused on twentieth-century music, Monelle’s point holds that “musical syntax does not necessarily carry semantic weight” (emphasis in the original).\(^{37}\)

In this document, my focus will primarily be on the narrative discourse, and temporal placement is not a central focus. I do note temporal cues, as in Stravinsky’s *Three Pieces for Clarinet Solo*, which is temporally static until the end of the first movement, but discussions of the specific temporalities in each analysis will be limited, except for “Bacchus,” in which chronology plays an important role in the interpretation. Overall, though, I focus on the fact that, “music invites us to step out of time into its own timeless state; or it gives us an experience of movement, passage, orientation.”\(^{38}\) It is enough for narrative analysis to acknowledge the presence of temporal organization without delving into specific temporal events.

The third essential narrative attribute is dialogue with a set of patterns or archetypes. While most narrative theories agree on the existence of distinct patterns, few agree on precisely what those patterns are. Northrop Frye suggests four archetypes: comedy, romance, tragedy and irony.\(^{39}\) James Jakob Liszka later modified these four archetypes by defining them as the “result from the intersection of two fundamental oppositions.”\(^{40}\) Byron Almén eventually adapted the same archetypes for music.\(^{41}\) Like Liszka, Almén uses the binary oppositions order/transgression and victory/defeat to define each of the archetypes: romance is victory of the order, tragedy is defeat of the transgression, irony is defeat of the order, and

\(^{37}\) Ibid., 83.  
\(^{38}\) Ibid., 86.  
\(^{41}\) Ibid., 64–67.
comedy is the victory of the transgression.\textsuperscript{42} However, Michael Klein calls into question the usefulness of Almén’s archetypes for music after 1900. Klein argues that most, if not all, modern Western music falls into the ironic category, and that success can no longer be considered as the foundational narrative basis.\textsuperscript{43} Klein offers narrative themes such as “question modernity, respond to alienation and dysphoria, ironize the past, [and] model the human psyche.”\textsuperscript{44} Other authors view elements of myth or folklore as basic patterns. Drawing from Lévi-Strauss, Victoria Adamenko suggests “structuring molds” drawn from mythology in twentieth-century music: “binary opposition, repetitiveness, variability, symmetry and numerical organization.”\textsuperscript{45} Roland Barthes developed five codes (hermeneutic, proairetic, semantic, symbolic, and cultural) that he suggests readers can use for understanding narrative structures.\textsuperscript{46} Other influential writers include A. J. Greimas, who proposed a “theory of narrative grammar,”\textsuperscript{47} and Vladimir Propp, who categorized elements of the Russian folktale.\textsuperscript{48} Although most of these recurring patterns were first pointed out in literary studies, music theorists have been able to adapt many of these ideas into narrative theories of music.

In the following chapters, I present a more generalized concept of archetypical patterns that draws on each of these resources. One concept that I adapt is Almén’s idea of transvaluation, which he defines as a process in which “a hierarchy set up within a \textit{system of}
signs is subjected to change over time.” The majority of the narrative archetypes suggest some kind of change over the course of the narrative, allowing the idea of transvaluation to apply in various contexts. The repertoire I analyze poses problems for Almén’s archetypes primarily along the victory/defeat axis, because there is ambiguity as to whether we are likely to “rhetorically align with the initial hierarchy or with the transgression.” Almén acknowledges that the alignment is an interpretive decision, but other patterns seem to better capture the narrative impressions of this repertoire. I categorize transvaluations by the resulting relationships between the initial order and its transgression, with a focus on synthesis, rejection (of either the order or transgression), and return. These broad categories contain nuances that engage with a variety of narrative organizational strategies.

In the following analyses, I illustrate my narrative interpretations and track transvaluations through the tools of transformational theory. As its name implies, transformational theory identifies mathematical transformations between musical objects, and also uses geometrical metaphors to describe the realities projected by music. I turn now to a brief overview of the transformational tools relevant to this document before detailing the specific points of contact between the two methods.

**Transformational Theory**

One strength of narrative theory is its ability to relate musical experiences to story arcs that are familiar from other aspects of culture. However, narrative descriptions are not always musically precise. While my philosophical focus is on narrative interpretation, the primary descriptive tools I employ are based in the mathematical branches of music theory. With foundations in David Lewin’s *Generalized Musical Intervals and Transformations (GMIT)*,

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50 Ibid., 53.
applications of mathematics to music have grown into a branch of music theory generally referred to as transformational theory. The name is derived from the transformational attitude Lewin discusses, in which intervals are viewed not only as a distance between two musical objects, but also as “characteristic-motion-through-space.” This attitude laid the foundation for a variety of studies exploring the group-theoretical structure of musical spaces. I divide the techniques I use into two broad categories of transformations – algebraic and geometric. The algebraic perspective relies primarily on Lewin, while the geometric perspective follows Dmitri Tymoczko’s alternative to Lewin’s method. After describing the various mathematical tools, I then discuss how I apply them to enhance narrative interpretations.

One principal domain of analysis is pitch and pitch class. Pitch class discussions will assume octave equivalence, unless explicitly stated otherwise. Discussions of pitches also assume twelve-tone equal temperament, with the semitone as the basic unit of musical distance. The direction of motion will often be considered, where positive values represent an ascent of \( n \) semitones, while negative values represent a descent of \( n \) semitones. For instance, Figure 1.1 shows two distinct musical events. The first is a diatonic step from C4 to D4, indicated as +2. Next a downward leap from G4 to C4 is denoted as -7, because of the descent of seven semitones. I use this orthography to illustrate transformations between macroharmonies as well as surface-level gestural changes.

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Much of transformational theory follows Lewin in a focus on transformations that are also operations, meaning they are one-to-one and onto, or that each element of the original set maps directly onto one and only one member of the target set (mathematicians refer to these types of operations as bijective). However, focusing only on operations poses some analytical challenges, especially when the cardinalities of musical objects are unequal. Steven Rings and Joseph Straus have each suggested ways to expand transformational practice: Rings by accepting non-bijective transformations, and Straus by addressing how close a given transformation is to an ideal bijective transformation (specifically transposition or inversion). I follow both Rings and Straus when modeling transformations between pitch collections.

One system for modeling gestural connections is Lewin’s interval function IFUNC, which can be applied to collections of different cardinalities. This function can be used to express all of the possible intervallic relationships between two collections of notes (or rhythms, gestures or other salient features). The interval function uses the Cartesian product of two sets by linking every element of one set to every element of the other as an ordered pair. According to Lewin, “IFUNC(X,Y)(i) tells us in how many different ways the interval i can be spanned between (members of) X and (members of) Y.” Using IFUNC can

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demonstrate the “statistical backdrop for intervallic events,” illustrating the aural range of a particular pair of gestures.55

In addition to voice leading, harmonic considerations are important, even in monophonic music. Considering the available intervals within a given musical gesture can be as illuminating as the comparison between collections seen in the IFUNC. To demonstrate this, I rely on Alan Forte’s interval vector, which presents the number of possible intervals in an ordered list. Unlike the IFUNC, which considers directed intervals, and therefore lists operations and their inverses separately, the interval vector collapses the intervals into interval classes and eliminates unisons. Figure 1.2 shows a five-note melodic fragment, and indicates its interval vector. Interval vectors are written in the following format 
\[ \langle n_1 n_2 n_3 n_4 n_5 n_6 \rangle \] with each coordinate representing an interval class (1 through 6, measured in fewest possible semitones between given pitch classes, irrespective of octave placement).

The interval vector \( \langle 123121 \rangle \) indicates that this set has a wide variety of intervalllic potential, with interval class (ic) 3 appearing most frequently, with three occurrences. Like IFUNC, interval vectors present a snapshot of intervalllic possibilities, but those possibilities are contained within one collection instead of through motion between two collections. These snapshots can help define the aural characteristics of particular gestures, allowing for comparisons of difference or similarity across a piece.56

55 Ibid., 101.
Figure 1.2: Five Notes with an Interval Vector of (123121)

While algebraic representations of musical spaces are useful, there are some drawbacks, as pointed out by authors such as Rings and Dmitri Tymoczko. Geometry provides useful resources in addition to algebraic representations of musical structures. I draw primarily from Tymoczko’s *A Geometry of Music* for geometric tools. Geometry can be useful in part because, as Tymoczko states, “the geometrical patterns virtually jump off the page…largely because our visual system is optimized for perceiving geometrical shapes such as triangles, but not for perceiving musical structures expressed in standard musical notation.” The visual nature of geometric models allows for succinct descriptions of musical objects. These succinct descriptions can then be applied in meaningful interpretations, whether narrative or otherwise.

Although he begins with single pitch-class space, Tymoczko’s work focuses primarily on musical spaces with two or more voices. His focus is understandable, given the prevalence of multiple voices in Western music, and his stated goal of defining an ‘Extended Common Practice.’ However, geometric models for single-voice pitch-class space are

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59 Ibid., 76.
important in this study. In some instances, the familiar pc-circle, shown in Figure 1.3 (a), will suffice, but more often, octaves must be differentiated, changing the circle into a helix (see (b) in Figure 1.3). In order to represent the helix more clearly in two dimensions, it will appear as a spiral, seen in Figure 1.4. This represents the helix of pitch space as though observed end-on, peering down the helix so that octave iterations are aligned. Motivic gestures can be illustrated on the spiral, creating a path-shape for a given motive. Octave leaps, while appearing short in this representation, should be visualized as a leap along the helix, linking successive loops, thus requiring significant musical effort. Conversely, smaller intervals can be imagined as traveling around the helix, requiring less effort as the distance decreases.

![Figure 1.3: The Pitch-Class Circle (a) with both letter and integer notation. Without octave equivalence, the pc circle becomes a helix (b) representing pitch space.](image)

Using the pitch spiral, similarities between transpositions (and near-transpositions) of motives are quickly apparent, as seen in Figure 1.5, which shows the opening subject of Bach’s Fugue No. 1 in C major from book one of the *Well-Tempered Clavier*. The left spiral

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60 Roger N. Shepard, “Geometrical Approximations to the Structure of Musical Pitch,” *Psychological Review* 89, no. 4 (July 1982): 305–33. Shepard’s article touches on some similar ways that pitch space can be represented.
shows the first eight notes of the subject, while the right spiral shows the first eight notes of the answer. Each arrow traces a path through pitch-space, with the arrowhead indicating motion forward in performance time. Comparing the subject and answer quickly shows that each motive moves with identical intervallic content, rotated around the helix to start on G4 in the answer. Motion of one or two semitones is illustrated as a short arc, while larger intervals (such as the perfect fourth) are drawn further away from the spiral path, leaping over a larger number of semitone points.

Figure 1.4: Pitch-Space Helix Represented as a Two-Dimensional Spiral

Figure 1.5: Bach, Fugue No. 1 in C Major, *Well-Tempered Clavier* Book 1. Fugue subject (a) and answer (b).
Although my focus is on monophonic works and single-voice pitch space, I also discuss three-voice pitch space. Tymoczko describes this space as a “repeating, periodic structure,” made of triangular prisms. The boundaries of this space consist of trichords of a single pitch class, such as (CCC), while augmented triads lie at the center and evenly divide the octave. Equal-tempered major and minor triads surround the augmented triads and form a lattice that is the primary emphasis of my discussion of three-chord space, illustrated in Figure 1.6. Each section of the lattice is a cube made up of two augmented triads, three major triads, and three minor triads. The edge of each cube represents voice leading by one semitone in one chord member. Chords within the same cube can be reached with relatively small voice leadings, with greater distance on the lattice implying a larger cumulative voice leading. Vertices that are vertically aligned are related by parallel voice leading in all voices, as in the leap from A-flat major to G major in the figure.

![Figure 1.6: Segment of the Lattice at the Center of Three-Note Chord Space. The dotted arrow indicates parallel motion in all voices.](image)

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Another tool adapted from Tymoczko’s theory is the pitch-class (pc) circulation graph.\textsuperscript{62} These graphs, an example of which is shown in Figure 1.7, show how quickly pitch classes are introduced into a piece. In the figure below, the x-axis represents the number of notes being considered, labeled as ‘window size.’ For each window size $n$, the music has been parsed into segments of $n$ notes. The average number of distinct pitches for each window size is then plotted, giving a view of just how ‘chromatic’ a particular piece is. The faster a piece introduces more pitch-classes, the steeper the slope of the graph is, until reaching chromatic saturation. Tymoczko points out some difficulties of these graphs, noting that simultaneous attacks must be randomly converted into individual notes, slow tempos can give the illusion of higher chromaticism, and that fast tempo or tremolos can make a piece appear less ‘chromatic’ than it is.\textsuperscript{63} Viewing monophonic music or focusing on melodic lines alleviates the first of these concerns. When comparing pieces of different tempos, I combat the issue of tempo by displaying window size as a percentage of the piece rather than individual notes.\textsuperscript{64}

Figure 1.7 displays the circulation graph for the first movement of Bach’s Cello Suite No. 1 in G Major, BWV 1007, a well-known monophonic work. In the figure, the entire work is charted, with 655 individual notes. This counts the final triple stop as one note (all the same pitch class), and separates the tied D4 in m. 22 into separate notes. Despite

\textsuperscript{62} Ibid., 158–164.
\textsuperscript{63} Ibid., 159.
\textsuperscript{64} Although not explored in this document, a pc circulation graph might be considered as a representation of a particular path along a 12-dimensional hypercube representing twelve-note pitch class space. This approach would be similar to one explored in Robert W. Peck, “A Hypercube-Graph Model for N-Tone Rows and Relations,” in \textit{Mathematics and Computation in Music}, ed. Jason Yust, Jonathan Wild, and John Ashley Burgoyne, Lecture Notes in Computer Science 7937 (Springer Berlin Heidelberg, 2013), 177–88, http://link.springer.com/chapter/10.1007/978-3-642-39357-0_14.
remaining in essentially one key, Bach’s piece reaches chromatic saturation at the window size of 410 notes. After reaching this saturation, any larger windows continue to average the maximum number of available notes—twelve. The point of chromatic saturation indicates the point when all twelve pitches have appeared at least once; in Bach’s Suite, the twelfth pitch class (B-flat) first occurs in m. 26, approximately 62% of the way through the piece. Considering the window starting on the first note, a window of 410 notes reaches just up to the B-flat introduced in m. 26.

Figure 1.7: PC Circulation Graph for Bach Cello Suite in G Major, No. 1, First Movement

Figure 1.8 graphs the same piece, but only considers windows up to 420 notes, just after the point of chromatic saturation. This view provides a closer look at the curve, making some features clearer. The steep slope reaching to eight pitch classes indicates a quick introduction of eight pitch classes in the first few measures. It also means that any given span of 1-40 notes (with 40 notes making up about 2.5 measures) will likely contain about 8 pitch classes, as expected for a tonal work. The gradual leveling of the slope indicates a slow
addition of pitches as larger segments are considered. While the pc circulation graphs do not give specific information about the kinds of harmonies that are present, viewing the graph as an illustration of the cumulative pitches used can suggest where new pitches are introduced, how quickly saturation is reached, and the overall cardinality of a piece’s macroharmony.

![Average PCs](image)

Figure 1.8: PC Circulation Graph for Bach Cello Suite in G Major, No. 1, to Point of Chromatic Saturation

### III. Synthesizing Narrative and Transformational Theory

Although the above analytical methods approach music from different viewpoints, my goal is to explore important points of contact between the two, and to forge useful analytical links between narrative and transformational approaches. The goal is not to create a new, overarching theory, but rather to create analyses that demonstrate what Rings calls “dialogical pluralism,” and Almén terms “methodological eclecticism.”

The tools of transformational theory are “most powerful in the pluralistic exploration of

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phenomenologically rich local passages.” My aim is to use the descriptive power of transformational methods and combine it with narrative’s “structural correlation of musical events with meanings,” in order to better understand a repertoire that theorists have not thoroughly explored.

Both of these branches of theory focus on tracking logical changes in music. The transformational perspective then applies the metaphor of a group structure or a path on a geometric shape to describe the changes, while narrative theory turns to metaphors of archetypes and story patterns to describe similar changes. As the following examples show, combining the two perspectives can strengthen the consistency of an interpretation, as well as suggesting new possibilities for investigation and introspection among a variety of musical styles.

I will use the well-known opening example from *GMIT* as a point of departure for my synthesis. Figure 1.9 reproduces Lewin’s figure that shows two musical events, $s$ and $t$, as points connected by an interval, $i$. Lewin and others have gone on to explore a myriad of ways that $i$ can be imagined, primarily as harmonic, melodic or rhythmic motion. The idea of interval goes deeper, however, for $i$ does not simply move $s$ to $t$, but transforms the entire set containing $s$ into the set where $t$ replaces $s$. Stated in another way, the characteristic motion that moves $s$ to $t$ also implies a similar relation for every element of the first set onto an element in the second set. Figure 1.10 demonstrates how applying different $i$ values to the same set can change the entire outcome, creating different generalized interval

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69 These implied extensions may or may not be immediately relevant to a given analysis, as explained by Lewin, *Generalized Musical Intervals and Transformations*, 27.
systems (GISes), even if one pair of elements is the same in both situations. In the figure, both systems act on the integers modulo 4 (\( \mathbb{Z}_4 \)). In the first GIS, \( i_1 \) is an operation that exchanges the values of 0 and 1, as well as the values of 2 and 3. In the second GIS, \( i_2 \) is an operation that increases the value of all elements by one (mod 4). In both GISes, the value 0 changes to the value 1. However, all other values after application of \( i_2 \) are different from the values after application of \( i_1 \). This highlights the importance of context for transformations.

Now, suppose that we consider \( i \) a transvaluation in a narrative sense. Both columns begin with the same initial order or hierarchy (0,1,2,3), and both are changed through an operation – \( i_1 \) and \( i_2 \), respectively. These result in new orders that have a specific relationship to the initial order, and can be described by the new set of characteristics observed (1,0,3,2) for the first GIS, and (1,2,3,0) for the second column. In this example, the characteristics of initial order and new order are simply the arrangement of the numbers, but in a musical context, characteristics might involve a variety of musical elements, such as rhythms, pc sets or macroharmonies, which can be explicitly described by mathematical relationships. Furthermore, the operations \( i_1 \) and \( i_2 \) correspond to narrative archetypes, which change the relationships between beginning and ending hierarchies in particular ways.

\[ i \quad t \]

\[ s \]

**FIGURE 0.1**

Figure 1.9: Lewin's Figure 0.1 from GMIT Illustrating the Concept of Interval\(^{70}\)

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A musical application of a similar concept will come from Almén’s *A Theory of Musical Narrative*.\textsuperscript{71} Chopin’s Prelude in G major, op. 28, no. 3 serves as an introductory analysis for Almén’s text. Almén isolates two musical gestures in his analysis, which he then uses to represent the conflict within the Prelude. Almén compares the opening and closing versions of the prelude and concludes that the two gestures are reconciled during the piece. Viewing these same gestures through IFUNC provides a supporting perspective. Figure 1.11 shows the original gestures and a chart of the possible intervallic relationships. Figure 1.12 shows the final synthesis of the two gestures. In this case, IFUNC can be understood as “a statistical backdrop for intervallic events.”\textsuperscript{72}

\begin{align*}
\begin{array}{c|c}
 i_1 & i_2 \\
 0 & 1 \\
 1 & 0 \\
 2 & 3 \\
 3 & 2 \\
\end{array}
\end{align*}

Figure 1.10: Set is the Integers, Mod 4 (\(\mathbb{Z}_4\))

\begin{table}
\centering
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|}
\hline
\(j\) & 0 & 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 & 10 & 11 \\
\hline
IFUNC \((a,b)\) \((j)\) & 9 & 2 & 5 & 3 & 9 & 5 & 0 & 4 & 3 & 5 & 1 & 2 \\
\hline
\end{tabular}
\caption{Chopin, Op. 28, No. 2 (mm. 3-6), Melodic Gestures}
\end{table}

\textsuperscript{71} Almén, *A Theory of Musical Narrative*, 3-10.
\textsuperscript{72} Lewin, *Generalized Musical Intervals and Transformations*, 101.
The initial comparison shows a variety of possible intervallic relationships between a and b, while the paths between $a'$, $b'$, and (ab) are much more constrained, indicating fewer possible paths between the sets. The agreement between the new versions of the motives adds another dimension to Almén’s observation of synthesis between “rhythmic, harmonic, melodic, and registral elements.” There were many possible paths between the original motives, but the final synthesis excludes the majority of options, leaving only a small number of possible intervallic relationships. While this example might seem somewhat trivial, it does demonstrate an intuitive connection between algebraic descriptions of musical objects and narratives superimposed on those objects.

Figure 1.12: Chopin Op. 28, No. 3 (mm. 20-26), Melodic Synthesis

### Three Unaccompanied Works for Woodwinds

The three works analyzed in the upcoming chapters each engage with intersections between narrative and transformational theory in unique ways. None are tonal in the functional sense, but all have varying degrees of centricity, and are written in each composer’s unique idiom. Without strong tonal cues, other forces can engage a narrative mindset, especially an

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unexpected change, a shift in character, or an expectation for developments to come. These case studies begin to explore the potential of a mathematically informed approach to narrative analysis.

Debussy’s brief piece for solo flute inserts the potential for narrative from the outset through its title – either the published title, *Syrinx*, or the original title *La flûte de Pan*. Both titles link the piece to ancient Greek mythology – an excellent place to start a narrative. Additionally, the piece is tied to a poem that itself contains a story, but not necessarily the same story presented by *Syrinx*. The music itself lends to a narrative mindset, as its opening phrase sets up expectations for resolutions. The resulting narrative finds the initial order being overturned by something new, with scalar and pitch centricity coming to the fore in the analysis.

In Stravinsky’s *Three Pieces for Clarinet Solo*, the three movements can be combined into one narrative arch. The first movement suggests a lyric past, with a central pitch along with limited pitch and rhythmic resources. It is not until the end of the movement that a narrative mindset might be engaged, when a final gesture upsets the stasis of the movement in several ways. The rupture spins into a fiery second movement that contains elements that are in many ways opposite from those of the first movement. The work finally synthesizes these two organizational techniques into a new hierarchy in the final movement.

The analysis of Benjamin Britten’s “Bacchus” applies my mathematically informed narrative to a piece that does not instantly lend itself to a narrative approach. Elements including a vague program, rondo form, and tonal ambiguity contribute to the movement’s lack of obvious narrative. However, a narrative listening stance can interpret formal repetitions as temporal shifts, and consider the vague program as an indication of a mythic
archetype that is revealed through repetitions within the piece. Furthermore, I suggest a possible connection with a specific story from Ovid’s *Metamorphoses* that complements the internal musical narrative.

**IV. Conclusion**

Music’s rich nature implies the need for a multifaceted approach to understanding its complexities. As implied by Mazzola’s work, one area for fruitful investigation comes at the intersection between psychology, mathematics and semiotics. Narrative and transformational theories both lie within that domain, and each possesses unique analytical strengths. In the following chapters, I will explore a few of the possibilities for intersections between these two analytical methods. My goal is to stimulate musical thought not just in an analytic sense, but to suggest possibilities for performance and strategies for listening as well. I turn first to Debussy’s brief and ostensibly programmatic work for solo flute, which is a staple of the flute repertoire and serves as a compelling introduction to a transformational narrative analytical method.
CHAPTER 2. DEBUSSY’S SYRINX

I. Introduction

Debussy’s work for unaccompanied flute presents many challenges both to scholars and performers. Even the proper title has received some attention, because the piece was first performed by Louis Fleury in 1913 as La Flûte de Pan, but was published in 1927 under the title Syrinx. The change of title has been attributed to the publisher’s desire to avoid confusion with an earlier song “La Flûte de Pan” from Debussy’s Chansons de Bilitis. The piece was originally intended as incidental music for the reading of Psyché, a poem by Gabriel Mourey. It is commonly assumed that the piece is meant to invoke Pan’s death, but Laurel Ewell notes that the piece may have originally been performed with an earlier part of the poem. While its original context is both important and fascinating, modern performances often do not include explicit reference to the poem, so the piece is left open to the interpretation of the performer and audience. As Ewell has shown, it is possible to imagine a mapping of musical events onto events in the poem, but other analysts have provided analyses largely independent from programmatic elements. This analysis also attempts to interpret the music through internal elements, rather than focusing on an external program. However, the basic scenery of the poem will be kept in mind, so that the analysis

74 Ernst-Günter Heinemann, Notes in Claude Debussy, Syrinx (Munich: G. Henle Verlag, 1994).
can be construed as though it is the music Pan plays *within* the story of the poem, containing its own narrative trajectory.

**Other Analyses**

Before beginning my analysis, I will briefly summarize some other analyses in order to situate this analysis within the body of literature. I have already mentioned Laurel Ewell’s dissertation, which focuses on a programmatic reading of *Syrinx*. Other authors include Jean-Jacques Nattiez, Richard Parks, William Austin and Robert Orledge. Nattiez wrote a well-known analysis of *Syrinx* as an example of his semiotic method. Parks’ analysis is primarily structural, with few interpretive remarks, while Austin’s analysis attempts to generalize attributes of *Syrinx* towards Debussy’s overall style. Finally, Robert Orledge suggests formal links to sonata form in his brief analysis.

Laurel Ewell’s 2004 dissertation focuses on evidence from a manuscript copy of the piece from 1913 that includes excerpts from Mourey’s text, and may have been used by Louis Fleury in his performances. Ewell provides an in-depth analysis of Mourey’s text before moving into her discussion of Debussy’s music. The scene is set in Pan’s grotto, where two *naïades* discuss the possibility of meeting Pan. The first, *L’Oreade*, tells the second, *La Naiade*, of the joys of loving Pan. *La Naiade*, however, is afraid of the seductive sounds of Pan’s flute. At *L’Oreade*’s insistence, *La Naiade* listens to Pan’s music – as composed by Debussy – and finally declares, “O Pan, I no longer fear you, I am yours.”

In her analysis, Ewell focuses on a “double tonic complex,” between B-flat and D-flat, and asserts “the members of the double-tonic complex at the outset are linked through

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78 The text of Act III, scene 1 from Mourey’s text is translated in Ewell, “A Symbolist Melodrama,” 80-83.
79 Ewell, “A Symbolist Melodrama,” 83.
two whole-tone scales encompassing the entire chromatic aggregate: WT1 with B-flat, and WT2 with D-flat.\textsuperscript{80} My analysis agrees with the assertion of prominent roles for both B-flat and D-flat, but argues that neither truly reaches the state of “tonic.” I suggest the change between centricity towards D-flat and centricity towards B-flat is a gradual process rather than a situation with two simultaneous tonal centers. Furthermore, areas that are focused on B-flat tend to use semitonal motion rather than whole-tone. Other parts of Ewell’s discussion resonate with my own analysis, such as overall structure and some points of interpretation. Finally, Ewell connects her musical and textual analyses, mapping the musical changes onto the mental state of the naïade who is being tempted by Pan’s music. Conversely, my analysis traces a more generic narrative interpretation that follows the overturn of an initial order by a transgressive element. The more generalized strategy has the advantage of applicability to the performer/listener without need for knowledge of Mourey’s text.

Nattiez’s analysis invokes the semiotic method developed by Nicolas Ruwet along with theories on information retrieval to present an approach to stylistic analysis and warn against pitfalls of both structuralist and historicist approaches.\textsuperscript{81} In his analysis, Nattiez focuses on categorizing and organizing musical units that are comparable. He begins with lengthy and precise verbal descriptions of a segmentation procedure. He then collects the segments into a lexicon in order to concisely label the features of Syrinx. Many of the observations made by Nattiez are reiterated in my own analysis, such as his discussion of the tonal “poles,” which he lists as B-flat, E-flat and D-flat as the piece progresses.\textsuperscript{82} My analysis also strives to organize and describe the piece, but I use a different set of

\textsuperscript{80} Ibid., 30.
\textsuperscript{82} Nattiez, “An Analysis of Debussy’s Syrinx,” 7–11.
paradigmatic approaches. Like Nattiez’s lexicon, transformational descriptions define particular gestures, only without the need for an in-depth description of the label. Instead of relating the style of *Syrinx* to Debussy’s other works, my interpretation links the piece to narrative archetypes. Although our goals differ, both Nattiez’s and my analyses offer informative views of Debussy’s *Syrinx*.

Richard S. Parks’ brief analysis of *Syrinx* from *The Cambridge Companion to Debussy* serves a very different function than either Nattiez’s or Ewell’s analyses. Parks uses *Syrinx* as one of several case studies to discuss his analytical method that is focused on “dynamic structures,” which are musical elements whose changes over the course of a piece “convey impressions of vitality to us as listeners and performers,” and also “convey impressions of tension versus repose and of motion.”

Parks follows nine different elements, such as repetitions, register, and rhythmic durations, and charts how each element interacts with others to create a sense of tension and release. Though informative on the technical makeup of *Syrinx*, Parks’ analysis does not deal with practical applications of his observations, beyond a brief closing statement suggesting that “once our sensitivity to the subtle counterpoint engendered by diverse musical elements in *Syrinx* is heightened, we may more readily hear such rhythms throughout Debussy’s oeuvre.” Some of Parks’ observations are echoed in my own analysis, but through a different analytical lens that focuses on trying to incorporate observations from the sounding music and written score into an active interpretation.

William Austin’s analysis represents another approach to *Syrinx*. In his chapter on Debussy’s music, Austin chooses the unaccompanied flute piece as an example because it

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83 Parks, “Music’s Inner Dance,” 197.
84 Ibid., 219.
“shows many features of Debussy’s style in the least possible space.”\textsuperscript{85} Austin’s analysis is stylistic, so it focuses on broad features and describes motives in general ways, like “the drooping wavy line of measure 1,” and “the low, slowing loops of mm. 14-15.”\textsuperscript{86} My analysis attempts to describe the music in a more detailed way. This is not to say Austin’s analysis lacks useful insights. He points out specific rhythmic varieties, and his discussion of Debussy’s harmonic principles focuses on the whole tone, pentatonic and chromatic scales. Austin argues that “a diatonic norm does lurk behind the first phrase, and behind the whole piece,” but allows “the diatonic scales of Syrinx are not major scales…the other scales are modal, in the vague sense of the word.”\textsuperscript{87} My own discussion of pitch centricity focuses less on scale form and more on the shift from a focus on B-flat to a focus on D-flat. Austin’s discussion quickly moves from the specifics of Syrinx to other works of Debussy that are similar, most notably Prelude to the Afternoon of a Faun. Like Parks, only passing mention is made of Syrinx’s original function as incidental music.

Robert Orledge’s brief overview of Syrinx focuses on a formal description that makes tenuous links with sonata form. Orledge names the piece a “living adaptation of sonata form,” though his description does little more than categorize different motives and point out the significance of the “increasingly close links between the various aspects of the arabesque ideas.”\textsuperscript{88} The links to sonata form are weak at best, and detrimental to an understanding of the piece at worst. I focus on formal divisions and subdivisions that are audible, and advocate listening to changing relationships within the music to determine both formal and narrative structures.

\textsuperscript{85} Austin, \textit{Music in the 20th Century}, 8.
\textsuperscript{86} Ibid.
\textsuperscript{87} Ibid., 13.
\textsuperscript{88} Orledge, \textit{Debussy and the Theatre}, 254.
II. Analysis

According to Byron Almén, “the ironic archetype portrays the defeat of an initial hierarchy by transgressive elements.”\(^{89}\) Despite Klein’s trepidation about the prevalence of the ironic archetype in music after 1900, Almén’s archetype provides useful insights when applied to Debussy’s *Syrinx*.\(^{90}\) An initial hierarchy in *Syrinx*, centered on B-flat, is undermined and subverted by D-flat, which becomes the central pitch by the end of the piece. In developing this interpretation, an important clue is Debussy’s inclusion of a key signature in a piece that has been called an “extreme attenuation of tonality,” and contains ten distinct pitch classes in the opening two measures.\(^{91}\) For some pieces, programmatic titles like “Syrinx” or “La Flûte de Pan” could serve as effective hermeneutic windows, defined by Lawrence Kramer as points “through which the discourse of our understanding can pass” but, as I have discussed, neither title is necessarily indicative of meaning within this piece.\(^{92}\) Using the key signature as a window for meaning resonates with Kramer’s structural trope, which is “a structural procedure, capable of various practical realizations, that also functions as a typical expressive act within a certain cultural/historical framework.”\(^{93}\) The five-flat key signature suggests the possibility of D-flat major or B-flat minor to a musician of the Western tradition. Of course, Debussy rarely follows a simple, traditionalist model, and has been cited as declaring, “the tonal scale must be enriched by other scales.”\(^{94}\) *Syrinx* is in neither D-flat major nor B-flat minor, but the implication of the key signature remains. Laurel Ewell has also noted the B-

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\(^{90}\) Klein, “Musical Story.”  
\(^{93}\) Ibid., 10.  
flat/D-flat relationship, although she describes a “double-tonic complex” that relies on underlying whole tone scalar shifts. Instead of a double tonic, I hear B-flat as a central pitch that is slowly undermined and replaced by D-flat over the course of the piece. The replacement of the initial hierarchy (centered around B-flat) suggests that it was in some way deficient or ineffective, leading to its destruction and replacement by the transgressive element.

Formally, Syrinx can be divided into three sections, as summarized in Table 2.1. My analysis will discuss each section and its subdivisions in turn, following the musical transformations and interpretive transvaluations that lead to the eventual overturn of the initial hierarchy. Some defining characteristics of the initial hierarchy in Syrinx include B-flat as a primary pitch, motion by semitone, and transposition. The transgression, however, centers around D-flat, tends to move by two or three semitones, and favors either exact repetition or transformations other than transposition. As with most musical narratives, the different elements are changed and combined in many ways throughout the course of the piece, so that separating the two is not always an easy task. However, a brief example will serve to demonstrate the musical differences between the beginning and end of the work.

<table>
<thead>
<tr>
<th>Table 2.1: Formal Divisions of Syrinx</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measure numbers</td>
</tr>
<tr>
<td>Part One</td>
</tr>
<tr>
<td>Part Two</td>
</tr>
<tr>
<td>Part Three</td>
</tr>
</tbody>
</table>

95 Ewell, “A Symbolist Melodrama,” 29–33.
Figure 2.1 shows a comparison between the first six notes of the piece and the last six notes. I have counted the grace note in m. 35 as a ‘note’ in this case. When considered as pitch-class sets, both sets have a cardinality of five (due to a repeated pitch), but the sets are quite different. The first six notes comprise a connected subset of the chromatic scale, with prime form (01234), resulting in an interval vector of (432100), which favors interval class 1, expressed by semitonal motion in Syrinx. These notes are also rhythmically segmented into two subsets that are related to one another by transposition. The last six notes comprise a subset of the whole tone scale, with prime form (02468). Inclusion of the entire last gesture completes the whole tone scale.

The interval vector for the final six notes is (040402), indicating the complete removal of interval class 1 and thereby eliminating the possibility of semitonal motion.
Instead of two trichords, the last six notes make up a single rhythmic gesture, with a quintuplet leading to the sustained final note that is decorated by the grace note. Figure 2.2 shows these two gestures on the pitch-space spiral, illustrating the different motions between the opening and closing gestures. The transvaluation between these two musical entities can be interpreted as the driving force within a narrative framework for Debussy’s *Syrinx*.

Figure 2.2: Comparison of the Opening Gesture (left) and Closing Gesture (right)

The opening eight measures of *Syrinx* define both the initial order and the transgression. Figure 2.3 shows the first two measures, with the pitches in each beat grouped into pitch-class sets identified by prime form, and showing the transpositional relationships between the beats. Beats one and two of the first measure are chromatic trichords with the prime form (012), related by a transposition of -2 semitones ($T_{-2}$). The third beat contains four pitches, with a prime form of (0125), but omitting the D-flat continues the process from the first two beats, leaving a trichord with a prime form of (012) that is related to beat two by a transposition of -3 semitones. The second measure ignores the discrepancy of beat three, ending with another iteration of (012) that leads back to B-flat – the same pitch that opened
the movement. The repetition and prominence of B-flat in the opening phrase creates an expectation of centricity for that pitch within a chromatic macroharmony.

![Figure 2.3: Transpositions in the Initial Order](image)

The transgression, in the form of D-flat, enters at the end of the third beat of the first measure. D-flat can be considered a transgression within this context for several reasons. First, D-flat disrupts the chain of chromatic trichords established by the first two beats. The D-flat also stands out rhythmically by creating an even distribution of pitches in beat three, whereas the other beats are divided unevenly. Furthermore, D-flat is the lowest note of the opening phrase, and is followed by the only leap in the phrase. While the D-flat’s transgression is initially ignored, the opening measures prepare the way for further deviations from the initial order.

The second part of the opening section (mm. 3-8) continues the process began in the first two measures. Measure 3 is an exact repetition of the first measure, ending again with the transgression of the D-flat. The second phrase then continues with a new process that exhibits many features of the initial order while attempting to incorporate D-flat. Figure 2.4 shows m. 4, which begins with an expansion process, moving from trichords of prime form (014) to (015) to (016) in beats 1, 2, and the first half of beat 3. The expansion is arrested in the second half of beat three, as D-flat enters with a trichord that is also an instance of prime form (014). The rhythm, however, is no longer even, and the trichord is an inversion (I_{11}) of the first beat, as shown in the figure.
The inversional relationship is reversed in the following measure with a return to the same gesture as beat one of m. 4. The chromatic nature of the initial order is also present in the downbeats of m. 4, which comprise the same form of the (012) trichord used in m. 2 to end the first phrase, illustrated in Figure 2.5. While the new process does incorporate D-flat, it also leads to a pause on B-natural on beat 2 of m. 5, suggesting motion away from the original central pitch. The cadential gesture of mm. 6-8 respells the B-natural as a C-flat, and elongates the long-short rhythmic pattern of the opening in order to create a sense of slowing and an arrival with a descending E-flat to B-flat leap of a perfect fourth. This arrival suggests that the initial order has finally established its central pitch, and that it is prepared to overcome the transgression that has been introduced.

The three-part division of *Syrinx* is uneven, and the middle section is the longest. It can be broken into several subdivisions, shown in Table 2.2. In this section, B-flat is replaced
by D-flat as a viable central pitch, but the section ends with a reappearance of B-flat, as though in preparation for a return to the opening.

The second section opens with a restatement of the opening motive, one octave lower and complete with the disruptive D-flat, now near the bottom of the flute’s register. The registral limits of these four measures suggest an increased importance for the pairing of G-flat and D-flat, and reinterpret B-flat as a central axis between the two.\textsuperscript{96} Figure 2.6 represents this centricity spatially, with directed motion between nodes representing the gestures indicated. These four measures begin to move away from the initial hierarchy by employing a diatonic macroharmony and limiting transpositional relationships. Although B-flat is still a cadential goal, the nature of its importance has shifted, opening the possibility for G-flat or D-flat to be reinterpreted as an aural goal.

<table>
<thead>
<tr>
<th>Measure Numbers</th>
<th>Events</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm. 9-12</td>
<td>G-flat?</td>
</tr>
<tr>
<td>mm.13-14</td>
<td>Transition (initial order)</td>
</tr>
<tr>
<td>mm.15-20</td>
<td>E-flat $\rightarrow$ D-flat</td>
</tr>
<tr>
<td>mm. 21-25</td>
<td>Return to B-flat?</td>
</tr>
</tbody>
</table>

The initial hierarchy attempts to regain lost ground through a transition to new material in mm. 13-14. The uneven rhythm of the opening is expanded to accommodate a chromatic tetrachord (0123), echoing the downbeats of m. 4. The tetrachord is transposed three times, leading to an E-flat in m. 14, shown in Figure 2.7. Despite the return to transpositions and chromatic motion, the initial hierarchy is undermined yet again in this

\textsuperscript{96} A similar instance of Debussy using a pitch as a central axis is explored in Rings, “Mysteres Limpides: Time and Transformation in Debussy’s Des Pas Sur La Neige.”
transition. Instead of leading back to B-flat, the transition centers on E-flat and stalls out until an arrival on D-flat in m. 17. With an octave leap, this arrival opens space for the expansive nature of the transgression to challenge the tight, chromatic initial order.

Figure 2.6: B-Flat Acts as an Axis between G-Flat and D-Flat

Instead of transposition, the transgression favors repetition with alteration. After a repetition of m. 16, the octave leap of m. 17 is expanded from an octave to a ninth in its restatement in m. 19. The next three measures (20-22) favor the transgression, with even subdivisions of the beat, and constantly shifting figures that are similar but not related by
transposition or inversion. Despite a brief focus on D-flat in m. 17, the question of pitch centrality remains unresolved. B-flat begins to reassert its priority in m. 21 and comes to the fore in mm. 23-25. The arrival of B-flat suggests a return to the initial order and the possibility of a triumph for it, but the third section takes an ironic turn as the transgression prevails.

Although the third formal division (mm. 26-35) begins with a restatement of the opening material, the defeat of the initial order quickly becomes apparent. Instead of each phrase returning to B-flat, D-flat precedes every breath mark, and is approached through a descending gesture, now characteristic of the transgression. After two repetitions of the opening measure in mm. 26 and 28, the first gesture is rhythmically transformed, as shown in Figure 2.8, so that it uses only one beat and divides that beat evenly. The repetition of the transformed figure leads to an arrival on D-flat just before m. 31. This arrival solidifies the new role of D-flat as the central pitch, and B-flat is completely removed from the macroharmony of the last five measures, signifying the complete dissolution of the initial order.

The final phrases project a whole-tone macroharmony and do not contain any transpositions. Rhythmically, subdivisions of the beat, when present, are even, although the

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97 While not necessary for this particular analysis, Straus develops tools for calculating how close a given relationship is to strict transposition or inversion. See Straus, “Uniformity, Balance, and Smoothness in Atonal Voice Leading.”
characteristic transgression descent (G-flat, F, E, D-flat) is also absent. In its place is the whole-tone descent discussed at the beginning of this analysis, possibly representing the new order that has been formed from the destruction of the initial order.

III. Conclusion

This analysis has shown that listeners and performers can approach Debussy’s *Syrinx* as a piece with its own narrative structure, independent of any external program. However, this hearing can work in dialogue with an understanding of Mourey’s text. Ewell suggests that the opening scene of Act III “imagines the passage from the physical realm into the dream world.”98 This transition occurs as a *naïade* is seduced by the melody of Pan’s pipes. In the opening of the scene, *La Naiade* cries, “I am afraid, I tell you I am afraid, release me.”99 The *naïade*’s fear might be linked to the initial order that attempts to resist the expansive influence of the transgression. Like the musical transgression, *L’Oreade* persists in changing the initial order, claiming, “I am sure you will be unable to defend yourself from his love.”100 As the scene ends, *La Naiade* has surrendered, and her fear is removed, just as B-flat is removed from the final gestures of *Syrinx*. The ironic narrative that creates a new order might reflect the mental change of the *naïade* from resistance to submission, as Ewell suggests.

This simple mapping is not the only possibility – the narrative would work as well to describe Pan’s death (and transcendence?), or a fantasy imagined by Pan as he plays,

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99 Ibid., 81.
100 Ibid.
unaware of the naïade’s commentary. Transformational connections, such as transpositions and interval vectors, help to draw attention to the narrative transvaluations. Geometric representations of the opening and closing gestures also highlight the musical changes that occur during the piece. Whatever interpretation a performer or listener chooses, close attention to the changing qualities surrounding the two different tonal centers provides a viable approach to understanding this work of Claude Debussy.
CHAPTER 3. STRAVINSKY’S THREE PIECES FOR CLARINET SOLO

I. Introduction

In 1918, after completing his well-known L’Histoire du Soldat, Igor Stravinsky wrote what Richard Taruskin has called a “charming appendage”\(^{101}\) to the work, titled Three Pieces for Clarinet Solo. Stravinsky dedicated the piece to Werner Reinhart, who had financed the premier of L’Histoire du Soldat. Edmond Allegra, the same clarinetist who played in the premier of L’Histoire, premiered Three Pieces for Clarinet Solo in November of 1919. Despite humble beginnings, the Three Pieces have since become a standard of the clarinet repertoire.

Stravinsky completed Three Pieces for Clarinet Solo while living in Morges, Switzerland. The works of this period were influenced by a wide variety of sources, including Russian and other ethnic folk music.\(^{102}\) At this time, Stravinsky’s compositional output focused primarily on vocal compositions, but some, such as the Cat’s Cradle Songs, also featured writing for the clarinet. The exact influences on the Three Pieces are not clear, although most agree that jazz and ragtime helped to inspire the pieces’ musical vocabulary.\(^{103}\) Whatever the inspiration, the Three Pieces are rich works in their own right.

Stravinsky calls a successful performer one who interprets and is “an orator who speaks an unarticulated language.”\(^{104}\) However, it is not just the performer who must be educated, informed, and engaged. Stravinsky advocates his hope that “the listener’s musical


\(^{102}\) Ibid., 1443.


instruction and education are sufficiently extensive that he may not only grasp the main features of the work as they emerge, but that he may even follow to some degree the changing aspects of its unfolding (emphasis added).”\textsuperscript{105} Similarly, tracking value changes is one of the main goals of narrative analysis in music. Almén and Hatten stress that musical narrative “is ultimately a cognitive construction, which means that one may choose to interpret what might otherwise appear incoherent in terms of one or more…deformations of more traditional narrative constructs.”\textsuperscript{106} The themes and motives of Stravinsky’s \textit{Three Pieces for Clarinet Solo} are not easily used as agents of transvaluation. Instead, the following analysis will demonstrate that narrative can be derived from how the “set of rules that articulate the initial hierarchy” are transformed across the three movements.\textsuperscript{107} The characteristics of the initial order generally tend to be unchanging or static, while the disruption is constantly in flux. The transvaluation from initial order to disruption is exemplified through issues of pitch content, gesture, rhythm, and dynamics. As the piece progresses, each of these elements provides an avenue for a narrative interpretation through various appearances as an initial version, a disruptive version and a synthesis version. Table 3.1 provides a list of the various elements that make up the initial order and the transgression in the \textit{Three Pieces}.

\begin{table}[h]
\centering
\begin{tabular}{|c|c|}
\hline
Initial Order & Disruption \\
\hline
General Feature & \\
\hline
Unchanging & Fluctuating \\
\hline
\end{tabular}
\caption{Attributes of the Initial Order and Disruption}
\end{table}

\textsuperscript{105} Ibid., 133–134.
\textsuperscript{107} Ibid., 76.
(Table 3.1 continued)

<table>
<thead>
<tr>
<th>Initial Order</th>
<th>Disruption</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pitches</strong></td>
<td></td>
</tr>
<tr>
<td>Limited pitch-classes</td>
<td>Pitch-class saturation</td>
</tr>
<tr>
<td>Narrow Range</td>
<td>Wide Range</td>
</tr>
<tr>
<td>Guiding Fifths</td>
<td>Gestures</td>
</tr>
<tr>
<td><strong>Rhythm/Meter</strong></td>
<td></td>
</tr>
<tr>
<td>Consistent rhythms</td>
<td>Varying rhythms</td>
</tr>
<tr>
<td><strong>Dynamics</strong></td>
<td></td>
</tr>
<tr>
<td>Single Dynamic</td>
<td>Multiple Dynamics</td>
</tr>
</tbody>
</table>

I suggest that, like a play in three acts, the Three Pieces unfold a single narrative progression when considered as one unit. The first movement establishes and explores the attributes of the initial order before introducing the disruption that brings change to the austere order. The second movement abandons many of the attributes that make up the initial order, exploring the implications of the disruption’s tendency for variability. The final movement largely moderates between the two extremes, establishing a new order that is a synthesis of the initial order and its disruption. Adamenko suggests that the synthesis of a binary opposition is a “major characteristic of mythic thinking.”\(^\text{108}\) This synthesis is similar to Almén’s comedic archetype, in which the transgression (disruption) is victorious over the flawed or oppressive hierarchy (initial order).\(^\text{109}\) I find Adamenko’s less specific categorization more compelling for Stravinsky’s work. The mythic viewpoint opens space

\(^{108}\) Adamenko, Neo-Mythologism in Music, 28.
for an interpretation focused on the elements that are changing – a static timelessness against a busy activity – rather than attempting to determine whether to consider the story one of ‘victory’ or ‘defeat.’ In the following analysis, I focus on how the various opposing elements are synthesized, noting a consistent change from a value on static elements to a more active, yet controlled combination in the final movement.

II. Analysis

Transvaluations in Pitch Content

Pitch content, or macroharmony, is one area in which transvaluation occurs. The initial order of the first movement is challenged by the disruption, which comes to the fore in the second movement. The final movement mediates between the two opposing forces, creating a new order. An analysis of the pitch content transformations helps illustrate the path of the narrative trajectory.

Figure 3.1 shows a pitch-class (pc) circulation graph of the Three Pieces. In order to effectively compare the pitch circulation of the three movements, I have displayed the window size as a percentage of the piece rather than an absolute number of notes. Despite Tymoczko’s note that these graphs are “very crude tools,” they do demonstrate distinct differences between how and when the full chromatic aggregate is employed in each movement. The first movement does not reach chromatic saturation until the 105th note of 131 total pitches in the movement, or 80% into the piece. The second movement reaches

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110 The first two movements are indicated with a preference for clarinet in A, and the last movement is indicated with a preference for clarinet in B-flat. My discussions of pitches for all three movements will refer to notated pitches. There are three reasons to hold to the clarity of referring to the notated pitches. First, the work is unaccompanied, so there is no transposed reference point beyond what the clarinet plays. Second, all three movements both make use of the full chromatic aggregate. Third, the lack of functional tonality places focus on movement-specific relationships rather than intra-movement pitch relationships.

111 Dmitri Tymoczko, A Geometry of Music, 158.
chromatic saturation at pitch 125 of 290, or 43% into the piece, meaning that every pitch class has been used at least once for over half of the piece. The third movement moderates the use of all twelve pitches, arriving at the full aggregate at pitch 265 of 391, or 68% into the piece. The three lines on the figure show that the circulation of pitch classes in the first movement is considerably slower than the other two, and that the final movement spends more time with a limited set of pitch classes than the second movement. What the graphs do not show is how the pitch content of each movement is organized, or which pitches are used at any given time. A closer examination of each movement will demonstrate the various qualities of the initial order and the disruption, and show how those qualities are transformed and synthesized throughout the Three Pieces.

Figure 3.1: PC Circulation Graph for All Three Movements of Three Pieces for Clarinet Solo

Statistically, the differences between the lines are not significant, as indicated by a t-test with Bonferroni corrections. An ANOVA test also found no significant interaction between the lines. However, the lack of a statistically significant difference doesn’t preclude the possibility of an aurally noticeable difference, especially with this relatively small data set.
In the first movement, the pitch content stays primarily in the four-sharp diatonic collection with an added F-natural. In narrative terms, a listener could attribute the tendency toward diatonicism as an attribute of the initial order. This order is disrupted only a few times during the first movement, first at the brief appearance of A-sharp (m.12), then in mm.18-19, and finally at the coda (mm. 29-30). Each of these disruptions changes the macroharmony established in the opening measures. Figure 3.2 compares the initial order’s collection with the disruptions in mm. 18-19 and mm. 29-30. The cardinality of each of the first two collections is eight, and five tones are held common between them. In the first shift (mm. 18-19), common tones create a subtle aural effect, but Stravinsky insured the performer would notice a change by enharmonically respelling the common tones. The remaining three tones move either up or down by one semitone each, changing G-sharp to G, A to B-flat, and B to C, resulting in a combined shift of up one semitone. This small shift provides the first glimmer of a disruption to the unchanging macroharmony. This disruption, though brief, can prepare a listener for the possibility of future disruption, raising questions in the style of Barthes’ hermeneutic code. These questions can disrupt the tranquility of the initial order, if slightly, and prepare expectations for the more substantial disruption that occurs near the end of the first movement.

Unlike the collection change in mm. 18-19, the content of mm. 29-30 is strikingly different from the rest of the movement, and closes the movement while opening space for further developments. The overall shift in scale form is still only one semitone, but the aural contrast is greater than that of the initial disruption. Figure 3.2 illustrates several reasons for the greater impact. First, this shift has four common-tones, while the first change kept five

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113 Barthes, S/Z, 17.
tones in common. Second, the cardinality of the set changes from 8 to 7, forcing two pitches (G-sharp and A) to converge onto the same tone (B-flat). Most strikingly, the paths taken by the four non-common tones are more disjunct than the paths taken in the first shift. This marked disruption at the end of the movement may be heard as the start of narrative action in the *Three Pieces* – in addition to changes in macroharmony, the dynamic level changes for the first time, and the tempo increases slightly. The mythic timelessness of the opening is finally broken, and a new order is proposed in the final moments of the first movement.

![Initial Collection](image1)

**Figure 3.2: Transformations of PC Collections in Movement 1**

The second movement further explores the qualities of the disruption. As might be expected from the evidence of the pc-circulation graph, pitch content of the second movement is organized quite differently from the first. Formally, the movement is reminiscent of a rounded binary form, with a fermata and double bar marking the boundary between the two halves. Rather than holding to a primarily diatonic collection, this

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114 For more on the importance of secondary, non-functional parameters as triggers for narrative listening, see Leydon, “Narrativity, Descriptivity, and Secondary Parameters,” 308–28.
movement rotates through the entire chromatic aggregate by the end of the first formal section, with ten distinct pitch-classes appearing in the first phrase alone, shown in Figure 3.3. The high rate of progress through the twelve pitches is a clear contrast from the limited macroharmony of the first movement, suggesting the control of a new order that is in opposition to the initial, stable organization. The implications of that order are explored for the remainder of the second movement.

![Figure 3.3](image)

Figure 3.3: Opening Phrase of the Second Movement. Each pitch class is numbered the first time it appears.

The third movement’s rotation speed moderates between that of the first and second movements. By the first breath mark (m. 6), only six distinct pitch classes have been used. Despite the limited pitch classes, the collection is very different from the near-diatonicism of the first movement. The collection consists of pitch classes 1, 7, 8, 9, 10, and 11, expressed in prime form as (012346). This tightly packed set of pitches is expanded in each subsequent phrase, slowly building toward the total chromatic aggregate. During this process, rhythmic and motivic elements emphasize four pitch classes – 8, 9, 10, and 11 – through continued repetition. Despite the increasing size of the macroharmony, the repetition of these four pitch classes and their motivic content help create a new sense of stability, albeit one full of frantic energy.

Table 3.2 summarizes the changes of macroharmony that occur over the course of the *Three Pieces*. The opening of the first movement presents the four-sharp diatonic collection
with the addition of pc 5 as the macroharmony of the initial order. The macroharmony expands to contain the entire chromatic aggregate by the end of the first movement, disrupting the initial order. In the second movement, the chromatic aggregate is present for most of the movement, and most phrases contain at least ten distinct pitch classes. The third movement returns to a more limited collection at the phrase level, but still moves through the chromatic aggregate more quickly than the first movement. This synthesis is one way that the order of the first movement is challenged by and then synthesized with its disruption.

Table 3.2: Three Pieces, Macroharmonies and Their Narrative Interpretations

<table>
<thead>
<tr>
<th>Movement</th>
<th>Macroharmonies</th>
<th>Narrative Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Four-sharp diatonic (plus F-natural) → Chromatic Saturation</td>
<td>Order → disruption</td>
</tr>
<tr>
<td>2</td>
<td>Chromatic Saturation</td>
<td>Disruption</td>
</tr>
<tr>
<td>3</td>
<td>Chromatic Saturation, with a focus on chromatic tetrachord.</td>
<td>Synthesis</td>
</tr>
</tbody>
</table>

The narrative process of opposition and synthesis is also evident in the ranges of the three movements. Figure 3.4 illustrates the ranges of each movement, first in musical notation, then as a segment of pitch class space. The first movement establishes a narrow range that stays in the clarinet’s low chalumeau register except for the highest note, A4, which is considered a throat tone. The narrow range helps emphasize the lack of change inherent in the initial order. By contrast, the second movement favors the changing nature of the disruption, using the entire standard clarinet range (E3-G6). The wider range of the second movement is immediately audible, first with the opening leap of a minor seventh, followed shortly after by a descending leap of two octaves. The two-octave range grows wider in the first half, and the second formal division begins by moving back to and exploring the chalumeau register. The constant change suggests that the disruption of the initial order is the driving force of the second movement. The third movement moderates
between these two extremes. The range spans just over two octaves, but there are no leaps larger than an octave at any given time, and most of the movement stays between B4 and D6. The relatively stable range suggests the initial order, but it is now inflected with some characteristics of the disruption, specifically a wider range and a higher register.

![Figure 3.4: The Ranges of Each Movement in Standard Notation (top) and Expressed as a Segment of Pitch Class Space (bottom)](image)

**Gestural Changes**

In addition to the large-scale transvaluations of macroharmonies and range, gestural attributes also transform over the course of the *Three Pieces*. The organization of gestures through perfect fifths (and their inversions) is one important feature that changes over the course of the pieces. Joseph Straus has written about Stravinsky’s tendency to create a “bi-quintal structure,” involving “the juxtaposition of two structural fifths,” with one being melodic and the other harmonic.\(^{115}\) Straus’s examples use two separate fifths to create tension between melody and harmony, creating the “distinctively Stravinskian bite.”\(^{116}\) The monophonic nature of the *Three Pieces* poses a difficulty for Straus’s method – two (or


\(^{116}\) Ibid., 1.
more) fifths are juxtaposed, but there is no strong distinction between ‘melodic’ and ‘harmonic’ fifths. In the Three Pieces, the importance of interval class 5 (perfect fifths/fourths) is a characteristic of the initial order that is overcome by the disruption, which emphasizes rhythm and gesture instead of a particular interval class.

The first movement’s opening gesture, presented in Figure 3.5, can be segmented into three ic 5 dyads – \{11,6\}, \{8,1\}, and \{1,6\}. When expressed as fifths, the notes of the \{8,1\} and \{11,6\} pair of dyads are separated by two semitones, shown in Figure 3.6. Straus identifies pairs of fifths two semitones apart as a Model 2 relationship.\(^{117}\) He describes pieces with this relationship as “open, spacious, relatively consonant, and usually diatonic.”\(^{118}\)

![Figure 3.5: Three ic-5 Dyads in the Opening Gesture of Movement 1](image)

![Figure 3.6: Model 2 Relationship from Opening Gesture](image)

In addition to the dyads presented above, the first movement is developed from three other ic 5-relationships. These dyads act as guides on various structural levels, so I will refer to them as guiding fifths when they frame gestures or suggest various boundaries. Figure 3.7

\(^{117}\) Each model number corresponds to the distance, in semitones, between the lower two pitches. For details, see Straus, “Harmony and Voice Leading in the Music of Stravinsky,” 2-6.

shows the six guiding fifths of movement one. The first of these, \(\{8,3\}\), acts as a cadential indicator because every closing gesture in the A section ends with one of these two pitches. Section B does not contain ending gestures that end with pc 3 or pc 8, and instead uses the \(\{9,4\}\) relationship to guide its melodic gestures. However, pc 3 frames section B, helping to separate it from what comes before and after it. The remaining guiding fifths act on a foreground gestural level to generate specific motives and the movement’s macroharmonic content.

The six guiding fifths, however, contain one pitch that is not part of the initial order’s macroharmony – pc 10 (B-flat). This pitch class first appears in m. 12, spelled as an A-sharp, and is the first note to appear that is outside of the initial order’s eight-note collection. It does not manifest as a part of an ic 5 dyad until m. 18, when the macroharmony shifts and respells the pitches using flats. The B-flat, does not serve as the phrase’s goal, weakening its claim as a guiding fifth. Instead, the phrase continues, ending with stepwise motion from F-sharp to E. The central portion of the movement is guided primarily by the A-E \(\{9,4\}\) fifth, as seen in Figure 3.8. The section moves to low E seven times (indicated with open note heads in the figure), using repetition to create a sense of closure as the note is reached. The example also indicates the brief appearance of the \(\{10,5\}\) fifth as well. The disruption discussed in mm. 18-19 not only changes the macroharmony, but it attempts to provide a guiding fifth for the F-natural of the initial order.
Figure 3.8: Middle Section Guiding Fifths. The guiding fifths are indicated with slurs.

The first movement’s final gesture lacks a clear guiding fifth, and gives only an illusion of closure. The illusion is created by a reference to the cadential \{8,3\} guiding fifth. Like section B, the closing gesture begins and ends on pc 3, spelled as an E-flat. By reinterpreting D-sharp as E-flat, the transgression of the initial order is obscured aurally in order to create a plausible ending. However, the gesture is strikingly different from the rest of the movement, and these differences open rhetorical space for the changes to come.

The second movement begins the process of moving away from guiding fifths. The first half’s gestures articulate three ic 5 dyads, specifically \{7,2\}, \{0,7\}, and \{5,0\}. While these dyads frame gestures, the gestures contain many more pitches, and the fifths do not generate the macroharmony. The rules that organized the order of the first movement have been subverted, and a new, opposing system has been installed. Instead of a specific near-diatonic collection, the second movement freely uses the entire chromatic aggregate. The second half of the movement moves further away from guiding fifths – and the initial order – relying instead on an alternation of gestural patterns, labeled in Figure 3.9 as \(\alpha\) and \(\beta\). The first is characterized by a large, dissonant leap with a grace note before the second pitch. This
portion does not use ic 5, but instead relies on its characteristic rhythm and repetition to cohere.

Figure 3.9: Gestural Guides for the Second Half of Movement 2

The second gesture, β, is a stepwise descent in eighth-notes, decorated with grace notes. β does recall a guiding fifth, as noted in Figure 3.9. Figure 3.10 summarizes the alternation between α and β in the second movement, until the return of the opening material.

Figure 3.10: The Entire Middle Section Alternates between Two Gestural Patterns

The close of the movement completes the elimination of the reliance on guiding fifths. Figure 3.11 compares the opening of the second movement with the beginning of the movement’s last gesture. The final gesture begins as a slightly altered transposition, shifting pitches up by 5 semitones, except for the fourth pitch of the original gesture, which moves six semitones.

Figure 3.12 represents the first gesture of each phrase on a flattened helix, or spiral, representation of pitch space. This view highlights some of the similarities between the two
gestures. When considered with octave equivalence – collapsing the spirals into a circle – both gestures span only five semitones. Removing octave equivalence reveals similar paths through pitch space, with a focus on one pitch in three different octaves, pc 2 for the opening phrase, and pc 7 for the final phrase. This transformation suggests that the movement will be enclosed in a \{2,7\} dyad. However, the final gesture ends on pc 4, missing both pitches of the possible guiding fifth. Instead, the movement relies on the descending stepwise gesture, drawn from the opening phrases as well as the \(\beta\) gesture of the middle section, to provide final closure.

Figure 3.11: Near-Transposition between the Opening and Closing Gestures

Figure 3.12: Spiral Representations of the Opening (left) and Closing (right) Gestures
The final movement brings the story of the *Three Pieces* to a satisfying conclusion, largely through a synthesis of the initial order and its disruption. The movement is formed like a rondo, with a key recurring motive, shown in Figure 3.13, that anchors the movement. This anchor motive appears eight times, at five different pitch levels, illustrated in Table 3.3.

![Figure 3.13: Movement 3, Anchor Motive](image)

On the surface, the reliance on the anchor motive would seem to indicate that the final movement has embraced the gesture-dependent attribute of the disruption that directed the end of the second movement. However, a closer examination shows a set of interlocking fifths in the background that lead back to the opening pc 10. Figure 3.14 shows the background guiding fifth structure of the final movement, and identifies the relationships with the model numbers given by Straus. Measure numbers in the figure correlate with areas that focus on the given pitch, emphasized by the anchor motive, while transitions between each area are omitted. Only the last movement, using the combination of guiding fifths and a recurring gesture, succeeds in reaching closure at the same pitch level as the opening. While

![Figure 3.14: Movement 3, Background Guiding Fifths and Corresponding Model Numbers](image)
these relationships are not immediately obvious, they can suggest a reason why the final measure sounds convincing, despite the highly chromatic macroharmonies of the movement. The balancing moderation between two opposing orders helps complete the overarching narrative scheme of the *Three Pieces*.

Table 3.3: All Appearances of the Anchor Motive, Along with the Pitch That Is Emphasized

<table>
<thead>
<tr>
<th>Motive</th>
<th>Emphasized Pitch</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm. 1-2</td>
<td>B-flat</td>
</tr>
<tr>
<td>mm. 13-14</td>
<td>B-flat</td>
</tr>
<tr>
<td>mm. 18-19</td>
<td>B-flat</td>
</tr>
<tr>
<td>m. 33</td>
<td>B-natural</td>
</tr>
<tr>
<td>mm. 42-43</td>
<td>E-flat</td>
</tr>
</tbody>
</table>
Rhythmic & Dynamic Transvaluations

Rhythm and dynamics also contribute to a narrative arch following the order, opposition, and synthesis pattern. For both rhythm and dynamics, a tightly controlled initial order is opposed with wide variations in the second movement. The third movement acts as a mediator that integrates characteristics from both the initial order and its disruption.

Table 3.4 summarizes the rhythmic variety in each movement. Rhythmically, the first movement establishes a limited initial order with only three durations: grace notes, eighth notes, and quarter notes. As with pitch range and pitch classes, the quantity of rhythmic values increases in the second movement, with nine distinct durations: triplet sixteenth notes, regular sixteenth notes, quarter notes, eighth notes, grace notes, septuplet sixteenth notes, thirty-second notes, sextuplet thirty-second notes, and nonuplet thirty-second notes. The third

\footnote{Twice, the note values are lengthened slightly at the end of a phrase, first in m. 9, then again in m. 28. Because of their placement at phrase endings just before rests, I choose to interpret these two instances as notated rubato rather than separate rhythmic values.}
movement moderates between static and fluctuating, with six distinct note values: grace
notes, quarter notes, eighth notes, sixteenth notes, thirty-second notes, and triplet thirty-
second notes.

Table 3.4: Rhythmic Values in *Three Pieces*

<table>
<thead>
<tr>
<th>Movement</th>
<th>Rhythmic Values Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.</td>
<td><img src="Image1" alt="Diagram of note values" /></td>
</tr>
<tr>
<td>II.</td>
<td><img src="Image2" alt="Diagram of note values" /></td>
</tr>
<tr>
<td>III.</td>
<td><img src="Image3" alt="Diagram of note values" /></td>
</tr>
</tbody>
</table>

A transformational perspective highlights the durational differences between
movements. Figure 3.15 assigns the nine durations abstract values 0-8. Each row from Table
3.4 can then be reinterpreted as an unordered set, yielding \{0,7,8\} for the first movement,
\{0,1,2,3,4,5,6,7,8\} for the second movement, and \{0,2,4,6,7,8\} for the third movement.

Motion between durations can be viewed as an interval, totaling eight possible intervals. Like
pitch space on a piano keyboard, the durational space is bounded and lacks an underlying
group structure.\(^\text{120}\) Modified interval vectors, which account for the eight possible intervals
without inversion, display the disparity in potential rhythmic combinations among the three
movements.\(^\text{121}\) Movement 1 has only three possible rhythmic combinations, with an interval

\(^{120}\) For a discussion of similar interval spaces, see Tymoczko, “Generalizing Musical
Intervals.”

\(^{121}\) These interval vectors are essentially the IFUNC of the sets to themselves, as described in
David Lewin, “Re: The Intervallic Content of a Collection of Notes, Intervallic Relations
vector of \((10000011)\). The second movement consists of all possible rhythms (in the context of the *Three Pieces*), producing an interval vector of \((87654321)\). The third movement moderates between these two extremes, with fifteen possible interval combinations, \((24131211)\).

In addition to the wide variety of rhythmic values, the second movement is written without a time signature or barlines, and is, in the opinion of Richard Taruskin, “Stravinsky's one and only meterless composition.”\(^{122}\) The lack of meter, even the unpredictable meter of the first and last movement, creates what Taruskin calls a synthetic rhythm, in which the only grouping for listeners “is the total phrase.”\(^{123}\) The rhythmic variety and metrical freedom create a stark contrast to the simplicity of the first movement. The third movement, with rhythmic values that are grouped into distinct, repetitive motives, mediates between the rhythmic consistency of the first movement and the variety of the second movement.

![Figure 3.15: Rhythmic Durations Assigned Abstract Values](image)

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\(^{123}\) Ibid.
Dynamics, shown in Table 3.5, also support the narrative of opposition and synthesis. Both the first and last movement have one overriding dynamic level presented at the opening of the movement, with only small and gradual changes occurring before the end of each movement. In the first movement, the final measure – which marks the ascendancy of the disruption – is not only louder, but also faster, as if anticipating the second movement’s tempo.

Table 3.5: Dynamic Markings in *Three Pieces*

<table>
<thead>
<tr>
<th>Movement</th>
<th>Dynamic Markings Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.</td>
<td><em>Sempre p e molto tranquillo</em></td>
</tr>
<tr>
<td>II.</td>
<td><em>subito pp pp mp mf subito meno f</em></td>
</tr>
<tr>
<td>III.</td>
<td><em>f from beginning to end</em></td>
</tr>
</tbody>
</table>

Figure 3.16 depicts a space that contains all of the dynamic values in the *Three Pieces* and assigns an integer value to each dynamic level. Like pitch space, this dynamic space is continuous, with each dynamic value representing a single point in the space. Unlike pitch space, however, there are no equivalence relations like octave equivalence to allow the system to close. Instead, the space more closely resembles the set of all real numbers. The first movement, marked *Sempre p e molto tranquillo*, remains almost completely static, so that the dynamic, *d*, is approximately equal to 1 throughout the piece, as indicated in Figure 3.17.

124 The table shows only specifically indicated dynamic levels. The first and third movements also contain crescendo and decrescendo marks, which are conspicuously absent in the second movement.
The second movement contains sudden dynamic changes, often spanning multiple dynamic levels. Because it does not contain any markings for crescendos or decrescendos the second movement switches between dynamic levels as discrete points rather than gradually moving through the space. This results in a set of values so that \( d = \{0, 2, 2.5, 3\} \). I have interpreted the *subito meno forte* in the final gesture as a distinct movement from \( mf \) to a non-specific dynamic between \( mp \) and \( mf \), notated for convenience as 2.5 in dynamic space.

Figure 3.18 displays the dynamic levels of movement two on the dynamic space continuum. The first dynamic change aligns with the organizational change from guiding fifths to gestural repetitions. The arrival of the \( \alpha \) gesture coincides with a dynamic drop from *mezzo forte* to *pianissimo*, a change of three dynamic levels (\( mf – mp – p – pp \)). This change alone creates a wider dynamic contrast than the entire first movement. The second gesture, \( \beta \), is marked *mezzo piano*, bringing the dynamics up two levels. Initially, it appears that \( \alpha \) and \( \beta \) will each retain a specific dynamic marking, but the fourth iteration of \( \beta \) reverses the dynamic markings, appearing at *subito pianissimo*, followed by \( \alpha \) at *mezzo piano*. The wider range and discrete motions between dynamics represent a rejection of the order that directed the first movement.
III. Conclusion

One way to interpret Stravinsky’s *Three Pieces for Clarinet* is to hear a conflict between a rigidly stable initial order and a changeable disruption of that order. Rather than attempting to find characters or a narrator, my interpretation has focused on the interplay between rules that encourage stasis and rules that embrace change. Transformational and geometric tools such as the pc circulation graph, models of near transposition, and guiding fifths have demonstrated the specifics of both the initial order and its disruption in multiple domains,
including pitch class, gesture, rhythm and dynamics. Pitch class, dynamic and rhythmic spaces illustrate distinct differences between the organization of each movement of the *Three Pieces*. These opposites are finally mediated in the synthesis of the final movement. While my analysis has largely focused on events and elements from the score, the interpretation is, of course, subjective – I suggest the narrative strategy as one possible mode of listening for understanding this unique work.
CHAPTER 4. BRITTEN’S “BACCHUS” FROM SIX METAMORPHOSES AFTER OVID

I. Introduction

In 1951, while working on the successful opera *Billy Budd*, Benjamin Britten composed a work for solo oboe to be performed by Joy Boughton at the Aldeburgh Festival. The work, *Six Metamorphoses after Ovid*, Op. 49, was well received and has become a standard part of oboe repertoire. The six movements are named after characters from Ovid’s work that either experience or cause some kind of transformation. In addition to the programmatic title, each movement bears a short inscription that explains the movement’s mythical connections.

Unlike my earlier interpretation of Stravinsky’s *Three Pieces for Clarinet Solo*, I consider each movement of Britten’s *Metamorphoses* as musically and programmatically separate. As might be expected, the programmatic works are rich grounds for narrative interpretations.

Britten’s *Six Metamorphoses after Ovid*, Op. 49 has been characterized as a “tour-de-force of melodic invention based on distinctive themes which are developed to reflect the metamorphosis in question.”

Despite the links with Ovid’s text, not every movement projects an obvious narrative structure. This chapter focuses on the fourth movement, “Bacchus,” which resists immediate narrative interpretation. Part of this resistance is due to the inscription, “at whose feasts is heard the noise of gaggling women’s tattling tongues and shouting out of boys.” The titles of the other movements either specifically refer to the character who is transformed (“Narcissus,” “Niobe”), or the transformation is explained in the inscription, as in the first

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125 George Caird, “Benjamin Britten and Ovid’s Metamorphoses,” *Double Reed* 29, no. 3 (2006): 73.
126 Ibid., 75.
movement, which states, “Pan who played upon the reed pipe which was Syrinx, his beloved.”  

128 The title and inscription of “Bacchus,” however, do not suggest a specific transformation, either of Bacchus or of another character. Frank Mulder has presented programmatic analyses of each movement, and claims that, for “Bacchus,” “there can be no narrative story told in the music. This is more a character sketch of Bacchus and all the festivities connected with him.”  

129 Mulder then identifies specific sections reflecting the “shouting out of boys,” and the “gaggling women’s tattling tongues.”  

130 I suggest, however, that “Bacchus” is not a movement without narrative, but is rather a type of neo-narrative, or “music in search of new ways to tell stories.”  

131 While the program may not suggest a specific story, the musical details do fulfill each of the basic tenants required for narrative – representation, temporality, and archetype or familiar pattern. The result considers the multiplicity of festivities surrounding Bacchus, but encapsulates them within a single narrative framework.  

Elements of Narrative in “Bacchus”  

Although the title and inscription do not explicitly invoke a narrative mindset, they do contribute to the narrative framework of the movement. Both are examples of Barthes’ cultural code, which are “references to a science or a body of knowledge.”  

132 These provide an initial avenue for the referential aspect of narrative. Specifically, they signify the well-known Roman god and the feasts and revelry associated with him. Before the performance

128 Ibid., 2.
130 Ibid.
begins, the informed listener likely expects a certain amount of instability or unpredictability, along with drunken cheers associated with the parties of the god of wine. Musically, these expectations are realized through lively rhythms, an unpredictable meter, and contrasting rondo sections. For Peter Evans, the “phraseology [near the end of the movement] suggests a depleted village band, struggling to triumph through the hiccups and histrionics of the final bars.”\textsuperscript{133} Regardless of the specifics, “Bacchus” has the potential to represent outside events.

In addition to programmatic references, “Bacchus,” like any narrative, “creates its own ‘reality,’ the thing that it refers to.”\textsuperscript{134} During the duration of a performance of “Bacchus,” an aural reality is created through musical elements such as motives, harmonic language and meter. Meelberg states that perceiving and grouping music as discrete events allows the listener to understand the piece as “representations of events, which can subsequently be interpreted, say, as being part of a musical story.”\textsuperscript{135} Furthermore, he notes that musical narrative can “represent things, just like a verbal story.”\textsuperscript{136} The various events interact to create relationships, expectations, and resolutions. The following analysis focuses primarily on these ‘internal’ realities rather than the ‘external’ programmatic references. This allows for a more specifically musical narrative interpretation that interacts with, but is not dependent on, the suggested program.

Not only does “Bacchus” refer to particular events, but it also arranges them into a temporal structure. Rather than unfolding in a diachronic order, the rondo form presents contrasting episodes that return to a refrain, creating a disjointed, cyclic sense of time. The form is summarized in Table 4.1. Metric irregularities in the refrains are juxtaposed against

\textsuperscript{134} László, \textit{The Science of Stories}, 12.
\textsuperscript{135} Meelberg, \textit{New Sounds, New Stories}, 125.
\textsuperscript{136} Ibid.
regular meter in the episodes. Motivic materials are related, but are significantly altered between episode and refrain. Because of the work’s mythic associations, the repetition and alteration of motives suggest a timeline in which, “a precedent is kept as an invariant of multiple replicas and versions of the same event.”¹³⁷ In “Bacchus,” the event is a motivic interruption, which I will later explore in detail. Chronologically, the metric regularity of the episodes suggest a fixed, and therefore past, event, while the refrain’s metric irregularity suggests an unstable present. Rather than proceeding in a straightforward manner, the story unfolds in a series of events that have been reorganized so that ‘past’ episodes interrupt the ‘present’ refrains. The full narrative implications of the temporal structure will be examined later in this chapter.

Table 4.1: Formal Diagram and Invoked Timeframes

<table>
<thead>
<tr>
<th>Formal Division</th>
<th>Measure Numbers</th>
<th>Meter (regular/irregular)</th>
<th>Invoked Timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td>A₁</td>
<td>1-14</td>
<td>Irregular</td>
<td>Present</td>
</tr>
<tr>
<td>B</td>
<td>15-24</td>
<td>Regular</td>
<td>Past</td>
</tr>
<tr>
<td>A₂</td>
<td>25-32</td>
<td>Irregular</td>
<td>Present</td>
</tr>
<tr>
<td>C</td>
<td>33-41</td>
<td>Regular</td>
<td>Distant Past</td>
</tr>
<tr>
<td>D</td>
<td>42-44</td>
<td>Irregular</td>
<td>External Time</td>
</tr>
<tr>
<td>A₃</td>
<td>45-49</td>
<td>Irregular</td>
<td>Present</td>
</tr>
</tbody>
</table>

The final narrative aspect situates the piece into a broad archetype or identifiable pattern. Through explicitly invoking the myths transmitted by Ovid, all six of Britten’s *Metamorphoses* are indebted to mythic structure. Almén and Hatten note “myth can also continue to serve as a wellspring for narrative patterns post-1900.”¹³⁸ Adamenko remarks, “myth seems to be collecting variants of the same idea, or archetype, even within one story;

¹³⁷ Adamenko, *Neo-Mythologism in Music*, 64.
¹³⁸ Almén and Hatten, “Narrative Engagement,” 74.
this archetype reveals itself through its multifarious appearance.”139 Eliade asserts that the value of archaic human acts is derived from “their property of reproducing a primordial act, of repeating a mythical example.”140 Instead of a simple narrative, “Bacchus” uses repetition and reinvention to invoke not one feast, but the totality of Bacchanalian rites that repeat the same mythic event. According to Adamenko, bricolage is an important part of mythical structures, suggesting that a myth consists “of all its versions, neither the true version, nor the earlier one, nor more-or-less authentic versions...there is no single true version of a myth” (emphasis in the original).141 These various versions can even appear within a single telling of the myth, so that “only by considering all the variants can one understand the archetypal message of the myth.”142 I suggest that for “Bacchus,” the archetypal message follows the unending conflict between two motives I identify as a statement and an interruption, which might be imagined to reflect the “women’s tattling tongues and shouting out of boys,” referenced in Britten’s inscription.143

Although “Bacchus” does not follow a simple narrative arc, a narrative mindset can be an effective listening strategy. Taking cues from the mythological context of Ovid allows the listener, analyst, or performer to trace the interaction between various elements in the movement and derive a story. I suggest that the irresolvable conflict between a statement and an interruption is played out multiple times during the movement. I now turn to a musical analysis that focuses first on the motives and their transformations before looking at the broader formal landscape in which they are situated. I conclude with a speculative

139 Adamenko, Neo-Mythologism in Music, 64.
141 Adamenko, Neo-Mythologism in Music, 68.
142 Ibid., 64–65.
143 Britten, Six Metamorphoses, 4.
interpretation that suggests a possible mapping of Ovid’s tale of Pentheus with Britten’s work.

II. Analysis

Motivic Conflict

The core conflict of “Bacchus” occurs between two distinct motives, shown in Figure 4.1. The first is a slurred dotted-eighth, sixteenth gesture, while the second is a staccatissimo, ascending group of three sixteenth notes. These two figures serve as the foundation for the movement. Each motive has rhythmic, articulation and contour distinctions that I will define in order to better follow the interaction of the two motives through the movement. The interactions between these distinct motives provide the driving force for the fourth movement of Britten’s work.

![Figure 4.1: Bacchus, m. 1](image)

The first motive, which I refer to as the statement, initially consists of a dotted eighth note slurred to a sixteenth-note two semitones higher. The slurred articulation coupled with the dotted sixteenth, eighth-note rhythm form the core of the statement motive. These two-note groupings appear in both ascending and descending versions, spanning between one and four semitones. The individual units of the statement are also combined to form stepwise lines, as shown in Figure 4.2. One final characteristic of the statement motive is repetition, which occurs on local and large-scale levels.

Rhythmic repetition is implied from the definition of the motive, which is focused on the dotted-eighth, sixteenth rhythm. Individual units are often repeated, as in m. 1 (see Figure...
On a larger scale, the statement motive creates an alternating pattern of half and whole step motion, summarized in Figure 4.3. The figure isolates the statement motive from section A₁ in order to reveal the repetition of single and double semitone motion. Instances of immediate repetition are enclosed within parenthesis, specifically at mm. 1, 6, 9 and 13. Grouping these local instances of repetition helps to reveal an overall pattern that alternates between single and double semitone motion. While the distinct rhythmic and interval pattern defines the statement motive in the refrains, other characteristics, such as repetition and slurred articulation are important elements of the episodes, which lack the dotted-eighth, sixteenth rhythm.

Figure 4.2: Instances of Stepwise Patterns in Statement Motive - (a) m. 3 and (b) m. 45

Figure 4.3: Alternation between Single and Double Semitone Motion in A₁
Throughout the three refrains (A₁, A₂, and A₃), the statement motive resists change, but ultimately fails. Figure 4.4 helps illustrate the extent of the change that the statement motive undergoes. The figure compares two IFUNC tables, the first between the statement units in mm. 1-2, and the second between the statement units in mm. 45-46. Both measures are the opening of their respective refrains, A₁ and A₃. Even a surface comparison shows significant differences in range. The first two measures only span a perfect fifth (F₄ to C₅), while mm. 45-46 span a range of a minor seventh (F#₄ to E₅). The IFUNC relationships show another diversity. Only five distinct interval types connect the first two measures, with the majority of possible relationships being ic 5, or a perfect fourth. The relationship between mm. 45-46 maintains the emphasis on consonant intervals, with an abundance of ic 5 and ic 3, but now contains eleven of the twelve possible interval relationships.

![Figure 4.4: IFUNC Relationships between Early and Late Versions of the Statement Motive](image)

<table>
<thead>
<tr>
<th>i=</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>IFUNC (m.1, m. 2) (i)</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>6</td>
<td>4</td>
<td>8</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>IFUNC (m.45, m.46) (i)</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>10</td>
<td>5</td>
<td>10</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

The statement’s failure to resist change is illustrated in another way in Figure 4.5.

This figure compares m. 13, which is the final occurrence of the statement motive in A₁ with m. 48, which is the final occurrence of the statement motive in the piece. In m. 13, the
repetitive nature of the statement is on full display, as the entire measure repeats the opening version of the statement four times. The final occurrence, however, contains four different versions of the statement unit, with three interval types and both ascending and descending contours. Despite its tendency for repetition, the statement motive fails to deny change.

The final beat of the first measure introduces the agent of change, which I call the interruption motive, shown in Figure 4.6. This motive immediately stimulates change, and seems to be the opposite of the statement motive in almost every category. Instead of a two-note slurred unit, the interruption is made of three staccatissimo sixteenth notes, followed by a rest that brings the measure to an abrupt end. Within the refrains, the interruption is always ascending, detached and scalar. While some individual units of the interruption motive are recycled, continuation is a primary characteristic of the interruption, which never repeats the same unit immediately.

Figure 4.7 shows m. 5, which is the longest grouping of interruption motives in the refrains, along with its restatement in m. 29. A close examination of the units reveals that, although all span three semitones, the scalar pattern is not a simple matter of three transpositions. Instead, beat two is a transposition (T₃) of beat one, while beat three is an
inversion ($T_2 I$) of beat two. Beat four follows as a transposition ($T_5$) of beat three. Similar relationships occur throughout the appearances of the interruption motive in all three refrains.

Figure 4.7: Transformations of the Interruption Motive

**Motives in the Episodes**

The rondo form of “Bacchus” consists of three refrains with two episodes and a formally separate cadential expansion (see Table 4.1). The attributes of the statement and interruption are recast in each of these sections, which each have their own tempos, tonal centers, and motivic content. Section B features a repetitive statement contrasted with a progressive interruption, but other attributes, including rhythm, contour, and articulation, are recomposed. Narratively, I suggest that section B represents a past in which the statement and interruption are more closely related than the versions present in section A. Section C combines the attributes of the statement and interruption even more seamlessly, using a single rhythmic pattern. I suggest this further combination suggests a distant past before the divergent characteristics become prominent. Finally, section D exists as the moment of separation, with the essential characteristics of stasis and progression explicitly juxtaposed. The reasoning behind some of these interpretive decisions will be further explored later in the chapter when I turn to a closer examination of the metric and formal structure of “Bacchus.”

Instead of a single-beat unit, the statement motive in section B is an elegant 8 beat gesture, reproduced in Figure 4.8. This figure incorporates elements of both the statement and interruption from A. Specifically, it has two-note slur groupings, staccatissimo
articulation on sixteenth notes, and rhythmic repetition. However, this gesture also contains both ascending and descending contours and incorporates leaps ranging from a perfect fourth to a minor seventh (5 and 10 semitones, respectively). The tempo marking (Più vivo) is a marked contrast to the initial tempo (Allegro pesante) contrasting lively (vivo) with heavy (pesante). The lively, bouncy nature of the statement motive in section B evokes an earlier time, before the heavy distinctions separating the statement and interruption became so prevalent. This historic version of the statement appears three times in section B, but leads to a different conclusion each time. The second entry of the statement gesture is metrically displaced, subverting the statement’s tendency for repetition.

Despite a two-beat expansion in m. 19, the historic statement gesture in section B continues to resist change, while the interruption continues to exhibit progressive tendencies. Figure 4.9 shows the first appearance of the interruption in section B. Like the historical statement, the historical interruption is significantly different from the original version. While the rhythm of the historical interruption is the same as the original, the contour and articulation are reversed from ascending, staccatissimo to descending, slurred. However, the interruption still creates a sense of progression, and only repeats the pitches used in m. 17 once, in m. 23. It also interrupts the regularity of the historical statement, because its arrival causes the following entrance of the statement to shift, occurring after beat three instead of after beat one, illustrated in Figure 4.9. As section B closes, the interruption introduces
chromaticism, closing the temporal window on the past by emphasizing the differences between the historical forms of the statement and interruption.

Figure 4.9: Interruption Displaces the Beginning of the Statement Motive

After the return to the present in A₂, section C presents an episode that evokes another temporal shift into a distant past. Section C separates into two phrases that suggest a classical parallel period, summarized in Figure 4.10. The opening gesture arpeggiates a C-major triad, focusing the section on C. Measure 37 terminates on a G, suggesting a half cadence, while m. 41 leads to arrival like an authentic cadence on C. Rhythmically, the section contains only sixteenth notes, other than the cadential break in m. 37 that divides the period. The contour of m. 33 serves as a gestural anchor, appearing three times – mm. 33, 35, and 38, shown in Figure 4.11. The slurred articulation and repetition within section C suggest connections with the statement motive, while the constant sixteenth notes suggest an elongated version of the interruption motive. By combining the two motives and recalling classical form, this section portrays the distant past, before the statement and interruption were oppositions. The harmonious combination of the two motives is not maintained, however, as two different gestures begin to develop in the final two bars of section C. Figure 4.12 highlights the development of two-note groupings and three-note groupings in the overall scalar descent in mm. 40-41. The scalar descent culminates on the arrival of section D, which articulates the conceptual break between the statement and interruption motives.
Section D might be considered a cadential expansion of section C, but the gestural and syntactical differences lead me to consider it a different formal event. Section D has an extremely clear division between statement and interruption motives, and I consider it a representation of the fundamental distinction between the two. Temporally, this event occurs outside of time, as an expression of the fundamental difference between statement and interruption. In section D, the statement is reduced to a single note held under a fermata – a gesture that is emphatically resistant to change. The interruption is tentative, but expands in each appearance, with an upward contour that reaches higher and lower as more notes are added to the gesture. This gesture also introduces the staccatissimo articulation that helps to define the interruption. Figure 4.13 shows the three transformations in section D, first
algebraically, then geometrically. The algebraic representation illustrates the individual motion of voices from gesture to gesture, while the geometric model takes each statement as a triad and situates them onto the lattice at the center of three-note chordal space, as described by Tymoczko.\textsuperscript{144} The four closing interruptions are all related by transformations of three or fewer semitones, and are therefore situated closely within the space. The first and last chords of the sequence, E major and E-flat major, are vertically aligned vertices, indicating an overall parallel descent of one semitone in each voice. This alignment is shown in the figure with the double-headed arrow connected with a dotted line.

Figure 4.13: Transformations of Interruption Motive in Section D (a) Algebraic Representation (b) Geometric Representation in Three-Note Space

\textsuperscript{144} Tymoczko, \textit{A Geometry of Music}, 85–92.
After revealing the primal forms of the two motives and their conceptual separation, the final bars return to the narrative present, with the transformations of statement and interruption examined earlier. Despite the changes, the conflict between the two motives is irreconcilable, and the movement ends with a reminder of just how distant the two are. The final measure restates the fundamental distinction heard in section D, transposed into the movement’s original focus on F. Figure 4.14 adds the final return of the section D interruption motive to the sequence from section D. The distance from E-flat major to F major is much greater than the distances within section D – six semitones – suggesting a large conceptual distance between the end of section D and the end of section A₃.

Figure 4.14: Final Transformation of the Fundamental Division, Noting the Large Distance between the End of Section D and the End of the Final Section (a) Algebraic Representation (b) Geometric Representation in Three-Note Space
Formal Considerations

The preceding analysis has focused on the interaction of the two primary motives in “Bacchus.” I now turn to a discussion of the formal design, which influences my temporal interpretation. While the conflict between the statement and interruption motives provides impetus for the movement, Britten’s manipulation of rondo form helps to articulate the conflict and suggests temporal shifts. Table 4.2 outlines the form of “Bacchus,” with specific attention given to the number of beats in each section. The repetitive nature of rondo form can invoke a mythic ritual, in which “repetitions are typically arranged in a certain order,” but “the blocks of repetitions in these rituals are of irregular length.” Likewise, each section of “Bacchus” is of a unique length, and has its own metric variations. The distinction between metric irregularity and metric regularity might suggest a distinction between an unstable present (the refrains) and a remembered past (the episodes). Furthermore, pitch centricity, as determined primarily by emphasis through repetition and strong metric placement, helps differentiate between the two episodes’ relationships with the refrains.

Table 4.2: Formal Divisions of “Bacchus”

<table>
<thead>
<tr>
<th>Section</th>
<th>Beginning Measure</th>
<th>Ending Measure</th>
<th>Number of Beats</th>
<th>Pitch Center</th>
</tr>
</thead>
<tbody>
<tr>
<td>A₁</td>
<td>1</td>
<td>14</td>
<td>49</td>
<td>F</td>
</tr>
<tr>
<td>B</td>
<td>15</td>
<td>24</td>
<td>40</td>
<td>C-sharp</td>
</tr>
<tr>
<td>A₂</td>
<td>25</td>
<td>32</td>
<td>26</td>
<td>F ➔ C</td>
</tr>
<tr>
<td>C</td>
<td>33</td>
<td>41</td>
<td>36</td>
<td>C</td>
</tr>
<tr>
<td>D</td>
<td>42</td>
<td>44</td>
<td>13.5¹⁴⁶</td>
<td>C</td>
</tr>
<tr>
<td>A₃</td>
<td>45</td>
<td>49</td>
<td>22</td>
<td>C ➔ F</td>
</tr>
</tbody>
</table>

¹⁴⁶ The measures I have labeled as D could also be considered a cadential extension or parenthetical elaboration. The number of beats is somewhat misleading, because each measure begins with a half note under a fermata, thus lengthening the experienced timeframe for the section. It is due to these fermatas as well as the division’s unique gestural content that I have chosen to consider D a separate formal event in this analysis.
The formal relationships between the refrains suggest a present that is enacted, restructured, and enacted again. The metric relationships between the refrains are summarized in Table 4.3. Asterisks note significant motivic differences between measures that are mapped together. This type of restructuring recalls a mythic archetype, which is “characterized by combinatoriality because the paradigmatic sequence implies interchangeability of elements.”\textsuperscript{147} A closer examination of the form and harmony will illustrate how the restructuring of the refrain’s return helps support the overall narrative interpretation.

\textbf{Table 4.3: Metric Relationships among A\textsubscript{1}, A\textsubscript{2}, and A\textsubscript{3}}

<table>
<thead>
<tr>
<th>Measure (number of beats)</th>
<th>Measure (beat difference from A\textsubscript{1})</th>
<th>Measure (beat difference from A\textsubscript{1})</th>
</tr>
</thead>
<tbody>
<tr>
<td>1(3)</td>
<td>25(0)</td>
<td></td>
</tr>
<tr>
<td>2(4)</td>
<td>26(-1)</td>
<td></td>
</tr>
<tr>
<td>3(4)</td>
<td>27(0)</td>
<td></td>
</tr>
<tr>
<td>4(2)</td>
<td>28(0)</td>
<td></td>
</tr>
<tr>
<td>5(4)</td>
<td>29(0)</td>
<td></td>
</tr>
<tr>
<td>6(3)</td>
<td></td>
<td>45(+1)</td>
</tr>
<tr>
<td>7(5)</td>
<td></td>
<td>46</td>
</tr>
<tr>
<td>8(3)</td>
<td></td>
<td>47</td>
</tr>
<tr>
<td>9(5)</td>
<td></td>
<td>48(+1)</td>
</tr>
<tr>
<td>10(4)</td>
<td></td>
<td>49*</td>
</tr>
<tr>
<td>11(2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12(2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13(4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14(4)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\textsuperscript{147} Adamenko, \textit{Neo-Mythologism in Music}, 65.
At the beginning of “Bacchus,” Britten’s time signature is denoted as 4/4 enclosed in parentheses. Instead of strictly maintaining four beats per measure, measure lengths in the refrains vary from two to six beats. The first fourteen measures form an asymmetrical parallel period, divided into 5+9 measures, tellingly separated by a fermata over the bar between mm. 5-6. The first five measures are relatively unproblematic metrically. The measures contain 3, 4, 4, 2, and 4 beats. For a listener these measures establish an expectation for predominantly four beats per measure. Tonally, F is suggested as a central pitch through repetition and metric accentuation, although the scalar patterns and chromaticisms leave the question of centricity vague.

The next section of the first refrain, mm. 6-11, has a more irregular metric profile, with 3, 5, 3, 5, 4, and 2 beats per measure. The odd fifth beats in mm. 7 and 9 are filled by interruption gestures, as though the motive is forcing itself into the form. The statement motive begins with a repetition of mm. 1-2, but when the meter shifts, the tonal center also drifts away from F, as mm. 8-10 all begin on E-flats that encourage motion away from F.

The cadential measures of A₁ return the metric emphasis to 4/4, with 2, 4, and 4 beats. F is also secured as a central pitch through arpeggiation of an F major triad in m. 12, four repetitions of F in m. 13, and as the first and last pitch of the interruption in m. 14. These final two measures demonstrate the disparity between the statement and interruption motives – the statement loudly repeats the same unit four times, while the interruption quietly ascends, breaking the heavy strides of the statement motive.

The metric and motivic content of A₁ is restructured in sections A₂ and A₃. Section A₂ reflects the more regular parts of A₁, mapping to mm. 1-5 and mm.12-14, while omitting all measures longer than four beats. The mapping is exact, with two exceptions. First, m. 26
restates m. 2, but omits one beat, shown in Figure 4.15. This omitted beat is never accounted for, and leaves the combined restatement of the refrain a beat shorter than the original, so that \( A_1 = A_2 + A_3 + 1 \). The fermata over the barline between mm. 5-6 is also omitted. The return of the cadential materials in mm. 31 and 32 is prepared by an ascent from C that suggests dominant-to-tonic motion, shown in Figure 4.16. This ascent fuses the statement and question motives together, displacing the initial attack by half of a beat, eliminating the dot from the eighth note, and beginning the interruption on the second sixteenth of beat two. The two-beat motivic fusion replaces the single triadic arpeggio from m. 12, but performs the same function of emphasizing the centricity of F in the following measure. The changes in section A\(_2\) favor the statement’s tendency for regularity, and focus section A\(_2\) both metrically and harmonically.

![Figure 4.15: Comparison of m. 2 and m. 15](image)

![Figure 4.16: Dominant to Tonic Motion and Fusion of Motives](image)
The irregular measures of the refrain that were suppressed in A_2 return in section A_3. In addition to the motivic transformations previously addressed, metric and tonal modifications also indicate the statement’s failure to resist the influences of the interruption. The largest change is the displacement of m. 11. Neither recurrence of the refrain contains a two-bar measure to match m. 11. However, the motivic content of m. 11 appears embedded within m. 45, illustrated in Figure 4.17. The metric comparison in Table 4.3 notes that mm. 45 and 48 are each one beat longer than their counterpart in A_1, accountingmetrically for the loss of m. 11 as an independent entity. Tonally, just as mm. 6-11 move away from an emphasis on F, mm. 45-48 deny the initial tonal tendency, and try to remain in the distant past (section C), with a focus on the pitch C. Only in the final measure, which reverts back to the motive of section D, is the original emphasis on F regained, though just as weakly as in the opening. In the final bars, the disruptions introduced in mm. 6-11 have finally come to fruition as the statement motive is irreversibly altered.

In contrast to the complex metric scheme of the refrains, the metric makeup of sections B and C are simple. The strict 4/4 meter of these two sections sets them apart from the uncertainty of the refrains, possibly suggesting temporal shifts from an unstable present
to a remembered past. Changes in macroharmony, however, imply each section has a different relationship to the refrains. Figure 4.18 displays the macroharmonic shift between section A₁ and section B. The macroharmonies have only two common tones, and all other pitches move up one semitone, for a total transformation of +5 semitones. C-sharp replaces F as the central focus of the new macroharmony, although the emphasis is extremely tenuous again. The tritone shift of the central pitch could be interpreted as recalling a painful memory of the past.

Figure 4.18: Change in Macroharmony between A₁ and B

Section C also changes macroharmony, but not as dramatically. Only two pitches are consistently changed in this section, as shown in Figure 4.19, B-flat becomes B-natural, and F becomes F-sharp. The F-sharp is enclosed in parentheses because F-natural also appears in the section. The closer macroharmony does not necessarily imply a closer temporal shift, however. I propose that the closer harmonic relationship indicates a more fundamental
likeness between this episode and the refrains, looking into the distant, mythic past when the statement and interruption were indistinguishable.

Figure 4.19: Change in Macroharmony between A₁ and C

Section B also has a certain amount of metric tension, which was implied in the motivic discussion. Figure 4.20 illustrates the placement of the statement motive against the regular 4/4 meter. The historic version of the statement motive occurs three times in the course of ten measures, but does not align with the 4/4 meter. The first statement is eight beats long, filling the first two measures. The second statement, however, begins in the middle of m. 17, and is extended two beats, for a total of ten beats. The final statement realigns with the meter, filling mm. 21-22. Section C, though, does exhibit metric alignment of motivic repetitions along with the regular meter. The uniformity of meter, motive and key in section C suggest a distant past in which the two motives of “Bacchus” were combined, while section B represents a nearer past where the distinctions were prevalent, but not as well formed as in the present-tense refrains.
The metric scheme of section D stands apart from any other section of “Bacchus,” just as its motivic makeup is distinct. As suggested in the motivic discussion, section D occupies yet another temporal space that is outside of the narrative structure. The fermatas expand the performance time of this section, and obscure the notated meter. Without accounting for the fermatas, the notated measures contain 3.5, 4, and 6 beats. This expansion mirrors the growth of the interruption gesture in section D, which begins with three notes, then four, five and finally six in its appearance at the end of the movement.

Section D also stands apart tonally. The triadic transformations examined earlier disregard the continued emphasis on C through the fermatas, and deny a true central pitch. Instead of a central pitch, there are two isolated events: the sustained C, and the arpeggiations that are not functionally related. This dichotomy again reflects the static versus progressive conflict between the statement and interruption motives.

**Making a Story**

While the foregoing analysis and interpretation have striven to be as clear, compelling and faithful to the music as possible, I have refrained from engaging with the interpretive question that considers the work’s title, *Six Metamorphoses after Ovid*. I have avoided this partly because, unlike the other movements, “Bacchus” does not have an inscription that
references a specific story from Ovid’s work. Instead, as I have noted, the inscription invokes a general mood about the feasts associated with Bacchus. I will now turn to the speculative task of considering if “Bacchus” might indeed be heard as a programmatic piece representing a specific story from Ovid’s text.

In Ovid’s text, Bacchus is featured in two stories, first in book 3, later in book 11.\textsuperscript{148} In book 3, Bacchus is indirectly pitted against Pentheus, King of Thebes, who opposes worship of the god in his city. In the course of the tale, Pentheus hears a story of how Bacchus transformed sailors into dolphins from a priest of Bacchus. Later, Pentheus is mistaken for a wild bore and killed by his own family. The story in book eleven is the better-known account of King Midas, who tragically asked to receive the ability to turn whatever he touched into gold. Although Britten’s work does not make clear which story the composer associated with the work, if either, I suggest that “Bacchus” is more than a generic depiction of a Bacchanalian feast, and might even be linked with the story of Pentheus. However, as this chapter’s analysis demonstrates, the association is not necessary for a narrative understanding of Britten’s music.

Of the two stories featuring Bacchus, only the story of Pentheus involves the wild festivities associated with the god. In this story, King Pentheus of Thebes is displeased that the people are worshipping Bacchus, and he sends men to kidnap the god. Instead, the men return with a priest of Bacchus, who recounts his own story of meeting the god and coming into his service. Pentheus has no mercy toward the man, and orders him hanged. However, Pentheus himself then goes to find and capture Bacchus. While he does find an active rite, Pentheus does not find Bacchus. Instead, the revelers spot him, with his mother and aunts

among them. Pentheus is not recognized, for in their frenzy the worshippers of Bacchus believe he is a wild boar and proceed to quite literally tear him apart with their bare hands.

A listener familiar with the story of Pentheus could imagine that Britten’s “Bacchus” depicts the tale. Pentheus, represented by the statement, resists the new worship of Bacchus, represented by the interruptions. Despite the protests of Pentheus, the revelry continues, until a priest is brought before the king and recounts his story, represented musically by section B. This works well with an interpretation that views section B as a past state, as the priest tells his story of an earlier encounter with Bacchus. The return of the refrain signals Pentheus’ interruption of the priest’s tale, and the order to kill the priest. At this point, Pentheus goes out alone to confront Bacchus, leading into section C. This account diverges from the earlier interpretation, and considers section C as Pentheus’ viewing of the wild Bacchanalian rites. Upon viewing the rites, “Pentheus was roused by their wild cries, his wrath rekindled by the savage clamor.” The crescendo to the fortissimo of m. 42 could be heard as his anger. The sforzandos of section D, followed by dynamically weak, struggling arpeggations, would take on a much darker tone in this hearing – after Pentheus is spotted, his own mother and aunts dismember him, oblivious to his pitiful cries for help. The arrival of A3 focuses on increased variety in the opening statement, as more of the people accept Bacchus, “by that example [the death of Pentheus] warned.”

I do not mean to suggest with this brief, speculative excursion that the preceding analysis needs additional programmatic underpinning, nor do I intend to suggest this interpretation is better or worse than the more generalized understanding presented earlier in

149 Ibid., 86.
150 Ibid., 87.
the chapter. Instead, this intellectual exploration is designed to test the boundaries of narrative analysis and, in the words of Michael Klein, strives to “tell stories.”

III. Conclusion

Despite the movement’s initial resistance to a narrative interpretation, this chapter has demonstrated the validity of a mathematically informed narrative approach to understanding Britten’s “Bacchus.” The movement develops from the initial motivic contrast between a statement and an interruption. Over the course of the movement, three major variations appear: a present version, past version and a distant past in which the two motives are combined. Transformational changes among motives and macroharmonic shifts help to quantify the differences between the refrains and episodes. Despite appearing in differing forms, the motives always express the same archetypical relationship, repeating the same cycle multiple times. The statement tends to resist change, while the interruption embraces variation. These qualities were demonstrated through a variety of transformational tools. The IFUNC showed the extent of change experienced by the initially static statement. Voice leading patterns clarified the basic tendencies of both statement and interruption. In sections C and D, the revelation of the distant past leads to an abstract break that stands outside of narrative time and illustrates the conceptual divide between the statement and interruption. Three-note chord space presented a view of the ancient interruption’s transformations, as well as the relationship to the final restatement of the interruption. The movement ends with that restatement of the conceptual conflict, hinting that the root of the separation continues.

Along with the internal references, this chapter also connects Britten’s work with a narrative sketch from Ovid’s Metamorphosis. While Britten did not expressly state whether

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this movement was inspired by a particular part of Ovid’s writings, the same elements studied in the earlier analysis can be adapted to correlate with the tale of Pentheus, who tragically died for resisting the worship of Bacchus. Together, the two readings of Britten’s “Bacchus,” attempt to demonstrate the flexibility of a narrative listening approach along with the precision of mathematical descriptions of transformations within the movement.
CHAPTER 5. CONCLUDING REMARKS

I. Discussion

My intention has been to synthesize two distinct approaches to musical analysis. I attempt to highlight underlying correlations between mathematical and narrative approaches, while exploiting the unique strengths of each technique. Both methods appeal to activities that are common to virtually all humans, such as organization and communication. Mathematical analysis organizes information through numerical patterns, while narrative organizes information through stories and archetypes. In synthesizing these two methods, a primary goal was to use the descriptive accuracy of mathematics to inform and shape the stories told from a narrative viewpoint. The transformational attitude, which seeks characteristic motions between musical events, blends well with narrative transvaluations that track value changes across a piece.

In order to ensure a convincing interpretation, my method encourages an approach that is centered on aural observations. While I often refer to the score as a musical artifact, each analysis begins with listening to the piece closely before forming any interpretation. This emphasis on music as a performance is not new – Lewin and Rings are among many influential theorists who advocate an aurally focused analytical mindset.\(^{152}\) Drawing from Mazzola’s four fundamental musical activities, this document starts with perception through both aural and visual studies of the piece and its score and attempts to produce a form of communication while emphasizing that listening, analysis, and interpretation are all

“activities and not passive contemplation.” Only after careful listening can the process of interpretation in the domains of narrative and mathematics begin.

After analytical reflection, my methodology encourages the development of compelling interpretations that are consistent with information from both written scores and performance practice. This document has focused on a unique repertoire that generally receives more attention from performers than theorists. Although few in number, quality monophonic works are important to performers who want to program approachable modern works that can be performed in a solo recital. Additionally, the repertoire has its own musical intricacies that should not be ignored. Each chapter highlights unique aspects of my methodology based on the contents of each piece.

Chapter 2 focused on Claude Debussy’s *Syrinx* for solo flute. The piece follows an ironic narrative archetype, in which an initial order is defeated by a transgression. I defined the primary transformation as a change from chromatic motion focused around B-flat to whole-tone motion focused around D-flat, and illustrated this motion with a transformational model. The initial order tends to use transpositions, while the disruption tends to use other types of transformations. I quantify the changes between initial order and disruption through a variety of tools, including interval vectors, geometric models, and set-class transformations. Of the three pieces analyzed, *Syrinx* works best with Almén’s basic narrative archetypes. The piece features two tonal centers that each vie for preeminence during the piece, until the first is finally eliminated from the harmonic vocabulary altogether. The mathematical precision of transformational models help to illustrate the intuitive narrative conflict of the piece, and works well in dialogue with earlier analyses of this famous piece.

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Igor Stravinsky’s *Three Pieces for Clarinet Solo* is the focus of the third chapter. Unlike the other pieces in this document, the *Three Pieces* have no program or other extra-musical references. This chapter demonstrates that a narrative approach does not need an external program, but can be inferred from elements within the music itself. Rules for organization are established, challenged and revised over the course of all three movements. The analysis traces the narrative arch in multiple domains, demonstrating a few ways in which narrative listening might be applied. I model macroharmonic changes through pc circulation graphs, and gestural and range shifts through various geometric representations of pitch and pitch class space. Dynamics and rhythmic durations are modeled with dynamic space and durational interval vectors. Guiding fifths are another important aspect of my analysis of the *Three Pieces*, and are represented with various transformational models. Incorporating the transformational attitude into the narrative analysis allows me to build an interpretation that precisely defines the various attributes of the narrative elements. The resulting interpretation focuses on a single narrative arch that follows a mythic model of order, opposition and synthesis, as described by Adamenko.\(^{154}\)

The final analysis looks at a single movement from Benjamin Britten’s *Six Metamorphoses after Ovid*. The movement, “Bacchus,” is notable in the context of the *Six Metamorphoses* due to its lack of an exact reference to Ovid’s text. Formally, it is more complex than most of the other movements and does not immediately lend itself to narrative interpretation. However, my analysis demonstrates that a narrative mindset can be revealing even when approaching such pieces. The resulting narrative for Britten’s work contains temporal shifts to the past and distant past, as well as a restructuring of the present moment.

This restructuring is exemplified through an analysis of the metric structure, which divides and reorganizes the irregular pattern of the opening refrain. The application of IFUNC clarifies some differences between opening and concluding gestures in the movement, further supporting the idea of narrative transvaluation within the movement. Finally, the geometric distance traversed in the closing arpeggios is suggestive of possible narrative changes. I conclude the chapter by suggesting a potential connection with Ovid’s tale of Pentheus, which also features a chronological detour to the past. This chapter helps to illustrate the flexible nature of the combination of mathematics and narrative.

II. New Directions

While this document has focused on monophonic repertoire, the techniques explored are in no way limited to this domain. Instead, I hope that the flexibility of the combined techniques allow future research to find underlying human consistencies beneath stylistically diverse music. Like Tymoczko, I believe my approach can help lead to “new insights into the relations between various musical styles.” By completing similar analysis in a broader repertoire, more underlying relationships could emerge.

One promising direction is the analysis of other twentieth-century works. The music of the twentieth century is often ambiguous, and frequently resists comprehensive interpretations. Combining a narrative mindset and the transformational attitude could assist in interpreting some of these pieces, regardless of the textures employed. While a broad variety of repertoire could be approached in this way, pieces with some level of pitch centricity, motivic or gestural connections, and a potential for perceptual continuity are prime candidates for mathematically informed narrative analyses. Like the works analyzed in this

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document, such pieces are often approachable at an intuitive level, but do not follow strict compositional methods such as serialism or classical tonality. Therefore, new approaches, such as the one described in this document, can help provide meaningful analytical reflections on ambiguous pieces.

A specific example of potential research is Paul Hindemith’s *Symphony in B-flat*. Hindemith’s symphony for concert band was written in 1951, and shares several stylistic features with the monophonic works examined in this document. Hindemith’s title specifically omits a mode, and the lack of notated key signature suggests a complicated relationship with the tonality suggested in the title. The complexity of the harmonic language is apparent in the first phrase of the opening theme, reproduced in Figure 5.1. The phrase begins and ends on B-flat, but reaches chromatic saturation within seven measures. Figure 5.1 numbers pitch classes the first time they appear. The motives within and between the prominent themes – many of which are drawn from the opening phrase – are viable candidates for transformational explorations. Additionally, the first movement of Hindemith’s symphony alludes to classical sonata form, which provides opportunity for narrative interpretation, as mentioned in chapter 1. Finally, the interconnectedness of themes, harmony and dynamics create a situation in which the piece may be regarded as “a representation of (discrete) events,” which “implies more than just listening to sound; it is a listening experience, the making discursive of what the listener hears.”156 This kind of representation, along with a sense of temporal arrangement and dialogue with archetypes allows a broad range of music to be considered with a narrative mindset.

Another possible expansion would be to apply this approach to music of other time periods. Although much of the application of transformational theory has traditionally been aimed toward atonal or tonally ambiguous music, many of the concepts can be transferred to common-practice tonality, as demonstrated by Steven Rings. Adding a transformational viewpoint to narrative theory, which is often focused on tonal music, can also provide new insights. In his superb analysis of the opening section of Brahms’s Op. 118, no. 2, Rings describes a conflict involving two motives as well as conflicting tonal centers centered on A and D. While Rings does not explicitly engage with narrative theory, he does employ narrative metaphors, such as “the cooldown that follows this D-apotheosis.” Rings’s analysis could easily serve as a model for an expanded analysis of Op. 118, No. 2 that would explore the tonal shifts that occur later in the movement and the striking effect of the return of the opening material in m. 77. Applying a more direct narrative interpretation to a transformational framework could result in a richer and potentially more accessible analysis.

![Figure 5.1: Hindemith, Symphony in B-flat, mm. 1-10, Cornet Solo, Transposed to Concert Pitch](image)

Extending the repertoire is only one possible direction for future work with this topic. An interdisciplinary approach such as the one explored in this document is a fertile area for

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Rings, *Tonality and Transformation.*

Ibid., 185–202.

Ibid., 197.
further generalizations and connections. Two particularly promising areas are a further quantification of narrative archetypes through stylistic studies of specific composers, and applications with performance and analysis. Each of these projects would explore new areas of the interaction between mathematics and narrative in music analysis.

One way that narrative archetypes could be more precisely defined would be through a corpus study. A stylistic study of a composer might compare opening and closing gestures in a particular composer’s works in order to determine if narrative genre correlates with a change in intervalllic gesture size. If gestures in a given composer’s repertoire contract or expand by $x$ while other works contract or expand by $y$, pieces might be grouped into a narrative archetype based partially on that relationship. Furthermore, multiple corpus studies could be coordinated to develop a precise definition for narrative archetypes within a specified historical setting, such as seventeenth century Vienna.

Another area of potential research would involve interaction between performance and analysis. While mathematical structure may not always be of immediate interest to a performer, interpretations based on such analyses could prove to be beneficial and influential for a particular performance. Studying the effects of different interpretations on performer choices and/or audience reaction could be a fruitful field of investigation.

Regardless of specific future applications, I hope that this document has provided a foundation to encourage a continued dialogue between various approaches to music analysis. No single methodology can ever fully capture the meaning found within a piece of music, but an interdisciplinary approach can often reveal new insights that more restricted approaches might miss. Finally, I hope that monophonic works of the twentieth century might find their way into more theoretical discussions as they continue to grow in popularity with performers.
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VITA

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