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Hypermeter and Phrase Structure  
in Selected Works by Stravinsky, Crumb, and Adams

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requirements for the degree of Doctor of Philosophy  
in Music

by

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# ABSTRACT OF THE DISSERTATION

## Hypermeter and Phrase Structure in Selected Works by Stravinsky, Crumb, and Adams

by

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Doctor of Philosophy in Music

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This dissertation studies the occurrence of hypermeter—the extension of metric organization beyond the measure level—in twentieth-century music. Meter is the hierarchical framework against which the listener relates melodic complexes on the musical surface, and this metric foundation is key to the listener’s understanding of the musical fabric as a whole. While many theorists have discussed the relationship between musical surface and metric structure in Classical- and Romantic-era music, the rhythmic and structural underpinning of twentieth-century repertoires has received far less attention.

In the tonal music of the Common Practice period, meter was relatively stable, but metric structure became increasingly complex in the twentieth century, with repertoires that avoid regularity across musical parameters. The aim of this monograph is to explore how the listener can intuit an underlying metric structure and track its relationship with the musical surface in

music that lacks metric regularity. To this end, I consider the hypermeter in three twentieth-century case studies—Stravinsky’s *Symphony in C*, John Adams’s *Road Movies*, and George Crumb’s *Vox Balaenae*—that retain some amount of metric or periodic regularity, while breaking away from the restrictive metric boundaries of the Common Practice era.

While in Common Practice-era music, regularly recurring, *equally* spaced beats were a precondition for meter, I argue that a regularly recurring pattern of *unequally* spaced beats can also project meter, and that the listener can identify a metric framework based on those repeating elements alone. Elements such as gesture, timbre, and the initiation points of phrases also support the perception of meter. By broadening the range of factors that we consider to create meter, and thus expanding the definition of meter itself, I argue that underlying metric structures do exist in music that is metrically irregular. In these metrically disorienting works, hypermeter is projected by phrase structure and goal points of phrases, in addition to periodicity and the alignment of multiple metric layers. In broadening the perception of meter to encompass these elements, this monograph hopes to considerably extend the range of repertoire for which large-scale metric analysis is applicable.

The dissertation of Samuel Martin Young is approved.

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*For my parents,  
who have supported me in everything I've ever wanted to do,  
from being in a rock band to going to graduate school.*

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## BIOGRAPHICAL SKETCH

Before he became a composer, Sam Young worked as a professional drummer, performing and recording with national touring bands DeVotchKa and The Samples. He received his Bachelor of Music in Music Composition at Metropolitan State University, Denver, where he studied percussion and piano, and served as adjunct faculty for two years. Sam flew east to earn his Master of Music from Mannes School of Music in New York, and then headed to the west coast, where he is earning his PhD in Music from the University of California, Los Angeles.

As a composer, Sam is interested in the soundscapes of both natural and urban environments, which are often depicted in his music. He has been a featured composer at festivals such as the Fairbanks Summer Arts Festival, California Summer Music, and the International Summer Academy of Music in Michelstadt, Germany. Sam is currently researching hypermeter and phrase structure in the music of Stravinsky, Crumb, and Adams, and developing an interactive sound installation that explores the nuances of language and the human voice.

## **Chapter 1: Introduction**

### **Part 1- Overview**

We interact with music as it unfolds across time. Since we cannot take in a piece of music as a whole in a single moment, as one may with certain visual arts, how do we as listeners receive, process, and organize the music that we hear? Because music is temporal, and because we are subject to the pacing of the live or recorded performance, we must make sense of it as it progresses. As listeners, we parse the physical signals of musical sounds to make sense of them, grouping them into meaningful segments. As with other perceptual tasks, we attempt to identify or create organized patterns, referencing them against frameworks that we form intuitively from what we hear.

Metric structure is one of these frameworks against which listeners construct meaning. Lerdahl and Jackendoff suggest that meter is a mental construct created by the listener—we build a piece’s metric foundation based on perceptual cues from the sounds we hear. These cues reveal pieces of this metric framework without exposing the entire structure, which is implied by events on the musical surface but often not explicitly stated.

### **Interaction Between Surface and Meter**

The relationship between audible musical events—the musical surface—and underlying metric structure has been discussed by a number of theorists; over the past 50 years these include Cooper and Meyer (*The Rhythmic Structure of Music*, 1960), Cone (*Musical Form and Performance*, 1968), Lerdahl and Jackendoff (*A Generative Theory of Tonal Music*, 1983), Carl Schachter (“Rhythm and Linear Analysis: Aspects of Meter,” 1987), and William Rothstein (*Phrase Rhythm and Tonal Music*, 1989). Although these theorists each focus on different

aspects of the interaction between rhythmic layers, their discussions center on one common theme—on all temporal levels, metric structure underpins and orients musical events, both individually and in complexes, such as motives, phrases, and phrase groups.

While many theorists have discussed the relationship between musical surface and metric structure in Classical- and Romantic-era music, there has not been adequate exploration of this rhythmic and structural underpinning in twentieth-century music. This lack of attention is perhaps understandable—the uniform phrase lengths, harmonic rhythms, and other reliably regular and balanced musical features of the eighteenth and nineteenth centuries gave way to irregularity in the music of the twentieth century. Drawing from the analytical methods of Lerdahl and Jackendoff, Rothstein, and others,<sup>1</sup> I wish to explore how discussions of large-scale metric structure can be expanded and modified to apply to selected twentieth-century repertoires.

### **Surface-to-Meter Relationship in the Twentieth Century**

In the tonal music of the Common Practice period, meter was relatively stable, and composers—consciously or not—used the interrelation between the musical surface and underlying metric structure, often playing with and subverting the listener’s expectations. But how did composers approach this relationship in the twentieth century, as metric structure became increasingly irregular and complex? A hallmark of certain twentieth-century repertoires is the tendency to avoid regularity across musical parameters. In many cases, the resulting irregularity evades familiar anchors of western art music, which can both disorient and captivate the listener.

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<sup>1</sup> Other significant contributions include those from Maury Yeston, *Stratification of Musical Rhythm* (1976), Joel Lester, *Rhythms of Tonal Music* (1986), Jonathan Kramer, *Time of Music: new meanings, new temporalities, new listening strategies* (1988), and Christopher Hasty, *Meter as Rhythm* (1997).

In music that lacks metric regularity, can the listener intuit an underlying metric structure and track its relationship with the musical surface, as they presumably can in metrically regular music? Is it possible to perceive a high-level metric structure to this music that extends beyond the notated measure, as one could in the tonal repertoire of the Common Practice period? In this monograph, I will address these fundamental questions, which will guide my exploration of hypermeter in three twentieth-century works.

## **Part 2- Literature Review and Defining Terms**

As mentioned above, there is a significant body of theoretical work focused on the interaction between rhythmic layers, specifically the alignment of melodic segments with underlying metric frameworks. Cooper and Meyer, and Lerdahl and Jackendoff discuss grouping of musical events at the local level and the role that metric structure plays in parsing these events into motives, phrases, and phrase groups. Cone and Rothstein take a wider view and consider the large-scale interactions between phrase structure and hypermeter (the extension of the strong-weak metric hierarchy beyond the measure level). Below is a summary of some of these authors' key concepts, which will be relevant to my study.

### **Stratification of Rhythmic Layers**

#### **Grouping Structure**

In *A Generative Theory of Tonal Music*, Lerdahl and Jackendoff focus on the stratification of rhythmic layers at the local level. Distinguishing two types of rhythmic structure, grouping and metric, they assert that the rhythmic positioning of events affects the listener's process of segmentation—how they make connections between notes on the musical surface. Note events on the musical surface project a metric structure that the listener internalizes and against which subsequent notes are referenced. Listeners use this metric structure to determine

the rhythmic placement of notes and make decisions about grouping structure, such as determining phrase lengths or defining boundaries between sections. In this way, surface events act as perceptual input in constructing both phrase groups and metric frameworks. Events emphasized on the musical surface act as markers, from which the listener interprets both a pattern of metrical accents and a coherent grouping structure.<sup>2</sup> According to Lerdahl and Jackendoff, in order to comprehend the rhythmic structure of a piece, the listener organizes the input of musical sounds into groups at many levels: motives, themes, theme groups, and entire sections. Performers similarly group sections of music to convey logical meaning, letting their intuition guide “phrasing” and articulation choices to support this meaning. Through the lens of grouping structure, the listener makes sense of a piece by determining what the musical units are, which units belong together, and how these units and groups are connected to one another.<sup>3</sup>

Lerdahl and Jackendoff observe that these groupings—or complexes—are hierarchical: smaller events (individual notes or motives) are contained within larger units (phrases or themes), which, in turn, are likely subsumed within an even larger-level group (theme group or section). Despite the complexity of this structure, a listener does not need to intentionally identify these groups; rather, grouping is an intuitive process guided by an individual’s musical experience (be it their exposure to music over a lifetime of listening, or their experience playing music at any level). In fact, Lerdahl and Jackendoff state as their aim to clarify why listeners organize music in the way that that they do, asserting that their theory should “account for the totality of the listener’s musical intuitions.”<sup>4</sup>

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<sup>2</sup> Fred Lerdahl and Ray Jackendoff, *A Generative Theory of Tonal Music* (Cambridge, MA: MIT Press, 1983), 17.

<sup>3</sup> Lerdahl and Jackendoff, *A Generative Theory of Tonal Music*, 13.

<sup>4</sup> Lerdahl and Jackendoff, *A Generative Theory of Tonal Music*, 8.

## **Metric Structure**

Though listeners infer both grouping structure and metric structure from the same series of notes, Lerdahl and Jackendoff argue that, from an analytical standpoint, meter and grouping must be kept separate, as it is the interaction between these structures that creates a great deal of interest and variety in music. In addition to grouping events on the musical surface, the listener intuits a pattern of strong and weak beats, creating a metrical framework against which to relate future musical events. The underlying meter is often not explicitly stated, but rather is suggested by the rhythmic placement of events. Meter is the hierarchical framework against which the listener relates melodic complexes, such as motives and phrases, and harmonic complexes, such as chord progressions. This metric foundation is key to the listener's understanding of the musical fabric as a whole; the rhythmic placement of individual notes and chords would mean nothing without the foundation of metric structure.<sup>5</sup>

## **Meter**

Let's take a moment to consider the definition of *meter*. According to Lerdahl and Jackendoff, meter is “the regular, hierarchical pattern of beats to which the listener relates musical events,”<sup>6</sup> and Lefkowitz refers to meter as the “hierarchical organization of strong and weak beats.”<sup>7</sup> But what creates this hierarchy—this alternation between strong and weak? While theoretical explanations differ, there is consensus among many theorists that a precondition for meter is the alignment of more than one layer of *pulses*. A single layer of undifferentiated eighth-note pulses (without any change in dynamics, pitch, length, timbre, etc.) will not create a metric

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<sup>5</sup> There is a parallel here with grammatical structure in language. Individual words lack meaning without an underlying grammar to place them into meaningful combinations.

<sup>6</sup> Lerdahl and Jackendoff, *A Generative Theory of Tonal Music*, 17.

<sup>7</sup> David S. Lefkowitz, *Music Theory: Syntax, Form, and Function* (UCLA Course Reader Solutions, 1999), 40.

hierarchy on its own, but when a second rhythmic layer is introduced—quarter notes, for example—the points at which these two layers align begin to create an alternation of strong and weak eighth notes, establishing the quarter note as the *beat*. This perception of strong and weak can be further intensified (or sometimes subverted) with the introduction of a third rhythmic layer—resulting in moments when all three layers align, analogous to the second, minute, and hour hands of a clock all arriving simultaneously at 12:00. Echoing Lerdahl and Jackendoff’s point, Carl Schachter notes that longer durational events help us understand shorter events as strong or weak, and, conversely, shorter durational events help us measure the distance between longer durations.<sup>8</sup>

The hierarchical nature of meter is recursive—we can find this strong-weak alternation on a number of metric levels in a piece of music. For example, at the quarter-note level in 4/4 meter we perceive an alternation between strong and weak eighth notes (the first as metrically strong and the second as metrically weak), while at the measure level the first and third beats are strong when compared with the second and fourth beats (the third as weaker than the first and the fourth as weaker than the second). We can also find this strong-weak alternation at levels above the notated measure. In Classical, Romantic, and contemporary pop music, we often find examples of four-measure phrases in which the first measure is metrically strong, the third is relatively weaker, and the second and fourth measures are weaker still. In this way, the metric structure of a four-measure phrase is analogous to a single 4/4 measure. Theorists refer to these higher-level metric patterns that extend beyond the notated measure as *hypermeter*. The complexes of measures that combine to create hypermeter are referred to as *hypermeasures*, and

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<sup>8</sup> In this study I consider the *beat* as the regular, felt emphasis, and the *pulse* as individual events at a subdivision level. For example, in 4/4, the quarter note is the *beat* while eighth notes and sixteenth notes are *pulses*. Other theorists take the exact opposite view.

the points of perceived metrical strength that make up those hypermeasures are termed *hyperbeats*. While hyperbeats often align with the downbeats of notated measures, they can be found in any metrical position. In some cases, hypermeasures may contain more hyperbeats than measures (see Chapter 2, Example 2.3 for an example of staggered alignment between notated measure and hyperbeats). Groups of measures that display strong-weak alternation can exist on multiple levels; a passage could conceivably have hypermeter at two-, four-, eight-, and sixteen-measure levels. The most common types of hypermeter are two-measure (*duple*), three-measure (*triple*), and four-measure (*quadruple*) groups. As with smaller metric levels, larger complexes, such as four- and eight-measure groups, are often made up of smaller components. For example, a four-measure group is likely comprised of two two-measures groups, while an eight-measure group can be made up of two four-measure groups. In these cases we can further define a quadruple hypermeasure as a *duple double hypermeasure*, and an eight-measure group as a *duple quadruple hypermeasure*, etc.

### **Metric levels**

Lerdahl and Jackendoff observe that there are often five to six metric levels within a piece of music. The intermediate level is what we perceive as the *tactus* or *beat*—the level at which the listener taps their toe or the conductor waves their baton. Extreme metric levels offer more metric flexibility—changes in subdivisions such as triplets, or irregularities in the large-scale hypermetric grouping will be less disorienting to the listener than will irregularities at the beat or measure level. Additionally, a metric level (often the *tactus*) can emerge from a rhythmic pattern that doesn't state that level explicitly. When we hear the rhythm in Example 1.1, we infer underlying layers of quarter notes and eighth notes, even though they are not present on the

musical surface.<sup>9</sup> The attacks on beats one and three, along with the eighth notes on the "ands" of two and four—i.e., the events on the musical surface—provide sufficient information for the listener to infer layers of eighth notes and quarter notes.

**Example 1.1.** Emerging metric levels



**Phrase**

As with meter, theorists posit various definitions of *phrase*, but a common theme is the movement through a passage toward the arrival at a goal. In Common Practice-era music, the goal is usually tonal, such as a melodic arrival or harmonic cadence. Lefkowitz defines phrase as “the smallest meaningful combination of melody, harmony and rhythm which concludes with a moment of relative stability.”<sup>10</sup> Sessions refers to the linear aspect of a phrase—a portion of music to be performed, literally or figuratively, in one breath—as well as to the importance of goal-oriented motion.<sup>11, 12</sup> Westergaard notes the importance of a listener’s recognition and anticipation of pitch content, that the listener can discern when “no further pitches are needed to

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<sup>9</sup> Carl Schachter, “Rhythm and Linear Analysis: Aspects of Meter,” *The Music Forum* 6 (New York: Columbia University Press, 1987), 4.

<sup>10</sup> Lefkowitz, *Music Theory*, derived from *The New Harvard Dictionary of Music*, 535.

<sup>11</sup> Roger Sessions, *The Musical Experience of Composer, Performer and Listener* (Princeton, NJ: Princeton Univ. Press, 1950), 13.

<sup>12</sup> William Rothstein, *Phrase Rhythm in Tonal Music* (New York: Schirmer Books, 1989), 3–15. In a detailed analysis of Johann Strauss’ *Blue Danube Waltz*, Rothstein argues for the importance of tonal motion in delineating phrases. According to Rothstein, the passage’s four-measure segments—which at first glance may appear to be phrases—are actually subphrases in a larger, thirty-two measure phrase, because the individual four-measure segments are relatively static tonally, and lack the tonal motion necessitated by his definition of phrase.

complete the phrase,”<sup>13</sup> and Rothstein further stresses the importance of goal-oriented pitch structure in the delineation of phrases: “[a] phrase should be a directed motion in time from one tonal entity to another; these entities may be harmonies, melodic tones, or some combination of the two. *If there is no tonal motion, there is no phrase.*”<sup>14</sup> Whatever their criteria for grouping notes and rhythms, the above definitions share the common theme of goal-oriented motion.

Just as hypermeter is an extension of metric structure, *phrase structure* is the higher-level concatenation of individual phrases into complexes.<sup>15</sup> Rothstein defines *phrase rhythm* as the interaction between large-scale phrase structures and hypermeter: “at levels larger than the single measure, musical rhythm comprises two analogous but distinct components: hypermeter and phrase structure.”<sup>16</sup> While these two components often work in tandem, they can understandably be confused with one another. Hypermeter is the large-scale, hierarchical organization of measures, while phrase structure considers the coherence of passages based on their musical content.<sup>17</sup> In tonal music, hypermeter and phrase structure are typically—but not always—aligned.<sup>18</sup>

### **Accent**

Any discussion of rhythmic structure necessitates defining *accent*. A seemingly straightforward concept—a note or event emphasized in some way—closer consideration of

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<sup>13</sup> Peter Westergaard, *An Introduction to Tonal Theory* (New York: W.W. Norton & Co., 1976), 311.

<sup>14</sup> Rothstein, *Phrase Rhythm in Tonal Music*, 5. (Writing specifically here about tonal music.)

<sup>15</sup> Rothstein, 14.

<sup>16</sup> Rothstein, 12.

<sup>17</sup> Rothstein notes that “other elements, such as articulation and dynamics, are generally supportive rather than determinative of phrase structure, at least in tonal music” (12–13).

<sup>18</sup> Much of Rothstein’s analysis focuses on the interaction between these two aspects of musical rhythm.

different types of accents and the factors that generate them reveals a more nuanced definition of this term. Joel Lester defines accent simply as the “relative strength of a note or event compared to surrounding notes or events,”<sup>19</sup> while Lerdahl and Jackendoff distinguish between three different types of accent—phenomenal, metrical, and structural. For our purposes, the distinction between these three types is crucial, as each plays a role in the perception of different rhythmic layers.

### **Phenomenal Accents**

Cooper and Meyer remark that “an accent is a stimulus...marked for consciousness in some way.”<sup>20</sup> *Phenomenal* accents are produced when events on the musical surface stand out in comparison to surrounding events, giving them emphasis. This emphasis can be created by changes including, but not limited to, dynamics, duration, pitch, timbre, and texture.<sup>21</sup>

Phenomenal accents are relative to the events around them—the initiation point of a note or percussive sound, for instance, even at a low dynamic level, creates an accent against the backdrop of a sparse musical texture. An accent caused by a dynamic change requires little explanation, but other types listed above may require a brief discussion. Durational, or *agogic*, accents produce emphasis through differences in note length. The most common is the emphasis created by a longer note value, (see Example 1.2), although a short note can create an

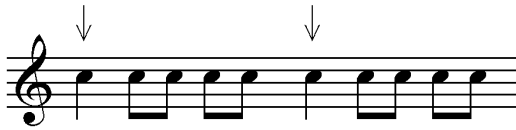
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<sup>19</sup> Joel Lester, *The Rhythms of Tonal Music* (Carbondale, IL: Southern Illinois Press, 1986), 11.

<sup>20</sup> Grosvenor Cooper and Leonard B. Meyer, *The Rhythmic Structure of Music* (Chicago: The Univ. of Chicago Press, 1960), 8.

<sup>21</sup> *Oxford Dictionary of Music*, Sixth Edition Revised, Edited by Tim Rutherford-Johnson, Michael Kennedy, and Joyce Bourne (Oxford Music Online, Oxford Univ. Press, 2018): “Any quality that distinguishes notes from their predecessors and successors can produce a ‘subjective’ or ‘perceptible’ accent.”

**Example 1.2. Longer note values create emphasis**



accent when surrounded by longer notes. Pitch changes also create emphasis; in an otherwise undifferentiated span of eighth notes, large or small changes in pitch will stand out to the listener (see Example 1.3). A change in pitch or harmony, as well as a change in timbre (for example a change from *sul tasto* to *sul ponticello* bowing on a string instrument), or in texture (as in a change from a single melodic line to a four-voice contrapuntal texture), serves as a new beginning that is marked in the listener's consciousness.<sup>22</sup>

**Example 1.3. Accents created by changes in pitch**



**Metric Accents**

A *metric* accent refers to any beat that is stronger than another or “relatively strong in a metric context.”<sup>23</sup> It is important to stress that metrical accents are not created solely by phenomenal or stress accents; phenomenal accents often serve to create an initial sense of metric accent, but the latter can be present even in the absence of the former (metric accents can actually occur on a rest). Phenomenal accents and metric accents often reinforce each other, but they can also directly conflict, as when syncopation occurs.

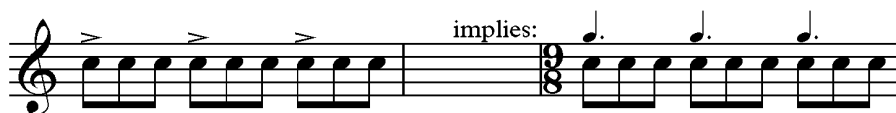
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<sup>22</sup> Lester discusses accents caused by changes in texture, in *Rhythms of Tonal Music*, 28–29.

<sup>23</sup> Lerdahl and Jackendoff, *A Generative Theory of Tonal Music*, 17.

Metric patterns are implied by phenomenal accents. For example, a pattern of eighth notes in which every third note is accented suggests the presence of a dotted-quarter-note rhythmic layer that will create a metric accent in groups of three (Example 1.4). The clarity or regularity of events on the musical surface can help the listener intuit a metric framework by establishing a pattern of metrical accents, and the listener subsequently references a parallel pattern of phenomenal accents against the metrical framework. Once established, metric patterns are typically self-sustaining and remain internalized to the listener even when faced with strongly contradictory evidence. When events on the musical surface are irregular, or if there is conflicting metrical information, the sense of meter becomes ambiguous. This is often the case in twentieth-century music, which frequently employs conflicting surface cues and irregular frameworks.

**Example 1.4.** Phenomenal accents imply metric patterns



**Structural Accents**

Structural accents are primarily produced by melodic or harmonic arrivals, such as cadences. These can occur locally at the phrase level, such as the cadence at the close of a parallel period, or at larger levels, such as the return to tonic harmony at the beginning of a sonata-form recapitulation. Lerdahl and Jackendoff define structural accent as “caused by the melodic/harmonic points of gravity in a phrase or section.”<sup>24</sup> Initiation points that produce phenomenal accents, such as changes in harmony, texture, or timbre, can also act as structural

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<sup>24</sup> Lerdahl and Jackendoff, *A Generative Theory of Tonal Music*, 17.

accents, suggesting the beginning of a new span, whether they occur at a local level (within a measure or phrase), or at a larger level (the beginning of a new section).<sup>25</sup>

Phenomenal accents relate to both grouping and metric structure, while metrical accents result from phenomenal accents. Structural accents relate most often to grouping structure at the phrase level; just as phenomenal accents and structural accents can either align or conflict, structural accents and metrical accents can either reinforce or conflict with one another.

The concept of structural accent as it relates to phrase structure and hypermeter has been contentious in the past. If a cadence occurs in a metrically weak position, for example on the downbeat of the fourth measure of a four-measure phrase, is the fourth measure then perceived as stronger than the first measure? Cooper and Meyer, and Cone argue for this position;<sup>26</sup> however, this seems at odds with the way listeners experience music. Although we feel a sense of melodic and harmonic arrival at a metrically weak cadence point, this arrival does not override our perception of the following downbeat as metrically strong—we feel the structural accent of the cadence in relation to the established metric structure. Along these lines, Lerdahl and Jackendoff, and Rothstein put forward the following revised position: structural accents that result from cadences occupy a point in the previously established metric framework, but they do not override that framework.<sup>27</sup> Rather, the two rhythmic layers work together to create a complete rhythmic picture. When a cadence marks the end of a metric segment, the two feelings of completion—harmonic and rhythmic—reinforce one another; the sensation of arriving at a

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<sup>25</sup> Lester, *Rhythms of Tonal Music*, 28–29.

<sup>26</sup> Cooper and Meyer, 19–20; Edward T. Cone, *Musical Form and Musical Performance* (New York: W.W. Norton & Co., 1968), 29–31.

<sup>27</sup> Lerdahl and Jackendoff, *A Generative Theory of Tonal Music*, 30–33.

goal is strengthened when the harmonic goal and the melodic goal are supported by the metric structure.<sup>28</sup>

In summary, like phenomenal accents, structural accents can either reinforce or conflict with metrical accents, but structural accents are independent of metric structure and the two should be viewed as independent layers of emphasis. In fact, we can view all three accent types—phenomenal, metrical, and structural—as occupying their own linear strata, at times reinforcing one another and at times conflicting.

### **Part 3- Applications to Twentieth-Century Repertoire**

In all of the above discussions—the interactions between phenomenal, metrical, and structural accents; Lerdahl and Jackendoff’s consideration of grouping structure and metric structure; and Rothstein’s study of the interaction between phrase structure and hypermeter—we find the common theme of the stratification of rhythmic layers. These authors have helped to illuminate the relationship between the rhythmic layers of phrase and meter; it is my intention to explore how this interaction can help us understand hypermeter in twentieth-century repertoire.

#### **Adaptation of Phrase Construction in the Twentieth Century**

While there is a large body of theoretical writing analyzing the relationship between phrase structure and metric structure in the tonal music of the Common-Practice period, the goal of this study is to trace the adaptation of phrase construction in certain twentieth-century repertoires, particularly those that are metrically irregular. Admittedly, there are large segments of twentieth-century music for which this discussion will be difficult, or possibly irrelevant, such as music that eschews any establishment of metric or periodic structure, or music that is so dense

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<sup>28</sup> Rothstein considers the alignment of three musical parameters: harmonic progression, hypermeter, and phrase structure. When all three parameters are in alignment, the feeling of arrival at a cadence is strengthened.

and complex that it becomes impossible to discern the underlying meter. The analytical methods of the above authors may need modification—or may fall short entirely—when applied to certain repertoire. Nevertheless, there remains a large number of works that explore non-traditional aspects of phrase construction and meter for which this type of analysis will be useful. In applying these analytical methodologies to metrically irregular repertoire, we can explore the ways in which this music draws on and modifies Common Practice-era interactions between melodic phrase grouping and underlying metric structure, and how these structures can help orient the listener.

### **Piece Selection and Monograph Organization**

Twentieth-century repertoire displays a full range of approaches to meter, from music that is completely arrhythmic—lacking metric organization of any kind—to music that clearly exhibits hypermeter, and everything in between. Somewhere in the middle of this continuum lies *monometric* music—music that “presents a rigid *succession* of beats, without forming a complex *hierarchy* of beats,”<sup>29</sup> resulting in a 1/4 time signature—a constant quarter-note pulse without larger metric organization. In this type of music, the listener can clearly perceive a beat, but the way in which those beats are organized into larger complexes is difficult to discern.

In searching for music to analyze for this project, I chose two pieces situated midway along this continuum, in which hypermetric organization is not always straightforward but exists to some degree, and one piece that, because of its unmeasured notation, presents greater challenges to hypermetric analysis. The three pieces I selected retain some amount of metric or periodic regularity (even in their irregularity), while breaking away from restrictive metric

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<sup>29</sup> Robert Fink, “‘Rigorous’: ‘The Rite of Spring’ and the Forging of a Modernist Performing Style,” *Journal of the American Musicological Society* 52, no. 2 (Summer 1999): 329.

boundaries linked to the Common Practice-era. Each case study exhibits different aspects of hypermeter and hypermetric organization. The opening movement of Stravinsky's *Symphony in C* uses clear, classically inspired phrase structure, but expands and contracts these phrases in interesting ways, as the hypermetric stability of the piece fluctuates between clarity and ambiguity. Movement I of John Adams's *Road Movies* is an interesting study in multiple overlapping metric layers, how the listener identifies and tracks these layers, and how metric layers align to potentially project a composite hypermeter. The third case study, George Crumb's *Vox Balaenae*, projects hypermetric structure solely through its phrase structure and the periodicity created by the alternation of timbre and melodic gesture. The listener perceives these structures in *Vox Balaenae* even in the absence of notated meter.

Now that I have defined some relevant terms relating to meter, hypermeter, and phrase structure, the organization of the remainder of this monograph is as follows: in chapter 2, I develop some of my own fundamental concepts, building on the analytical methodologies described above. I attempt to broaden the existing definitions of hypermeter—many of which were developed in the context of Common Practice-era repertoire—so as to apply the concept to a broad range of twentieth-century repertoire. My hope is that these terms and tools can further define the range of repertoire to which hypermetric analysis is applicable. Chapters 3–5 discuss the specific case study compositions listed above through the lens of hypermetrical analysis. Finally, chapter 6 summarizes the general theoretical ideas presented in chapter 2, synthesizes their applications in the case studies, and considers the potential relevance to twentieth-century repertoire.



**Example 2.2.** Irregular hypermeter at the *hypermeasure* level—uneven spacing between hypermetric downbeats

The image shows two staves of musical notation in 4/4 time. Above the first staff, a bracket labeled 'quadruple' spans the first four hyperbeats (labeled 1, 2, 3, 4), and another bracket labeled 'triple' spans the next three hyperbeats (labeled 1, 2, 3). The text 'Hypermeasure: 1' is above the first group, and 'Hyperbeat: 1' is above the first beat of each group. The second staff has a bracket labeled 'quadruple' over four hyperbeats (1-2-3-4) and a bracket labeled 'duple' over two hyperbeats (1-2). The text 'Hypermeasure: 3' is above the first group, and 'Hypermeasure: 4' is above the second group. The text 'Hyperbeat: 1' is above the first beat of each group.

### Broadening the Definitions of Meter and Hypermeter

In chapter 1, we found the factors associated with the perception of meter to be the alignment of multiple layers of pulses, an alternation of strong and weak beats, and regularly recurring beats. In the context of Common Practice-era music, for which these criteria and definitions were originally developed, the expectation was that these beats would be equally spaced.<sup>30</sup> As we move into repertoire that is less metrically regular, we can expand our definition of meter by removing the expectation that strong and weak beats will be equally spaced. With this modification, *regularity* plays a greater role in generating the perception of meter (imagine a relatively fast 5/8 meter featuring a recurring pattern of *unequally spaced* strong and weak beats). An interesting example of this, on both the metric and hypermetric levels, is the brass fanfare from the *Disappearance of Kastchei's Palace*, near the end of Stravinsky's *Firebird Suite*. The notated meter of this excerpt is 7/4, but one possible hypermetric reading of this passage is as an

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<sup>30</sup>As Lefkowitz notes: Even in the context of regularity, there are certain styles of music—for example dance forms like the *Sarabande* or *Waltz*—that accent beats that would not normally be accented (beat 2 in the *Sarabande* and beat 3 in the *Waltz*), and stretch these accented beats in ways that would make them not equally spaced, strictly speaking. (See Lefkowitz, *Music Theory: Syntax, Form, and Function*, 43.)

irregular duple hypermeter, offset from the notated meter (see Example 2.3).<sup>31</sup> In this example, the distances between the hypermetric downbeats of the triple hypermeasure and the hypermetric upbeats of the quadruple hypermeasure are unequal, but we can perceive the metric relationship because of the *regularity* of the repeating phrase. (See chapter 3 for further discussion of conflict between heard and notated meter.)

**Example 2.3.** Stravinsky, *The Firebird, Disappearance of Kastchei's Palace*, reh. 203, irregular duple hypermeter

Duple hypermeter: triple                      quadruple || triple                      quadruple

Hypermeasure: 1                      2 || 1                      2

Hyperbeat: 1            2            3            1            2            3            4            1            2            3            1            2            3            4

Allegro non troppo

brass: *f*

Tuba:

If we can understand patterns of *unequally* spaced beats at the measure level, we should be able to expand this perception to the hypermetric level as well, making it possible to follow an irregular hypermetric organization. Of course, listeners require *some* regularity or predictability to perceive hypermeter. What are some of the other factors that could influence our perception of hypermeter in the absence of equally spaced beats?

Additionally, we must address the issue of multiple hypermetric levels. In example 2.3a below, we see hypermeter at the two-measure level. We could zoom out further, to see that each two-measure hypermeasure constitutes a hyperbeat at a higher-level—hypermeter at the *four-measure* level, and indeed these four-measure hypermeasures can be grouped as a higher-level hypermeter, with each hypermeasure being comprised of eight notated measures. Within this

<sup>31</sup> For further discussion of this passage see: David S. Lefkowitz, *Analysis of Post-Tonal Music: A Parametric Approach*, 168.



### **Alignment of Phrase and Hypermetric Structure**

Drawing from our discussion of the interaction between grouping structure and metric structure in chapter 1, aspects of phrase structure may support the perception of irregular hypermeter. Motivic or melodic groups help the listener comprehend metric structures, and on a higher level, phrase grouping will likely project—or, at the very least, reinforce—hypermetric structure.

### **Goal Points Instead of Equal Spacing**

An idea that may help illuminate the perception of irregular hypermeter is Zuckeraudl's emphasis on goal points rather than equally spaced beats in the creation of meter.<sup>32</sup> Zuckeraudl asserts meter to be a cycle of moving toward and away from goal points. If we consider movement toward goal points as a driver of meter, we can further diminish the role of equal spacing in our expanded conception of hypermeter.

### **Predictability and Metric Organization**

Along these lines, another argument in support of our modified definition of hypermeter is Westergaard's definition of phrase, in which he stresses the importance of the listener's ability to anticipate pitch content. The listener can discern when “no further pitches are needed to complete the phrase.”<sup>33</sup> Even beyond Common Practice-era repertoire, a listener's ability to anticipate a phrase's completion, or to recognize a repeated melodic idea as the beginning of a new phrase segment, can help guide their understanding of phrase structure and illuminate the underlying metric structure. This same concept of anticipation may be key to the listener's ability to perceive hypermeter. If the listener can hear the direction of a melodic line and predict with

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<sup>32</sup> Victor Zuckeraudl, *Sound and Symbol: Music and the External World*, Translated by Willard R. Trask (Princeton, NJ: Princeton University Press, 1969), 151–200.

<sup>33</sup> Westergaard, *An Introduction to Tonal Theory*, 311.

some degree of accuracy where it is heading—as one can in the *Firebird* example above—then this anticipation can help reinforce hypermetric structure. Contrarily, if perceptual cues are arranged in such a way that they are completely unpredictable, then the listener will undoubtedly have trouble following large-scale metric organization.

### **Phrase Length and Hypermeter**

How can the conventional definition of hypermeter be modified to accommodate phrase lengths that do not adhere to a regular and predictable structure? As Lerdahl and Jackendoff, and Rothstein assert, phrase structure and metric structure are independent rhythmic layers that can either conflict with or reinforce one another. As discussed in chapter 1, phrase structure is encoded with information that projects metric structure, and, for this reason, phrase structure can help to clarify an otherwise ambiguous hypermetric structure. For example, a seven-measure phrase may help to articulate a seven-measure hypermetric group—perhaps a quadruple (duple-double) hypermeasure followed by a triple hypermeasure. A seven-measure phrase may be in conflict with an underlying eight-measure (duple quadruple) hypermeter, for example, or may help to clarify an underlying seven-measure hypermetric group. Just as melodic groupings can project metric structure, an irregular phrase can project irregular hypermeter.

### **Instability at Metric Extremes**

As discussed in chapter 1, instability or irregularity in middle metric levels, such as the *tactus*, is most disorienting to the listener, while irregularities at more extreme metric levels, such as subdivisions of the beat at the smaller level and hypermeasures at the larger level, are more easily understood.<sup>34</sup> If this is true, the listener should be able to perceive an irregular hypermetric structure if the *tactus* stays relatively consistent.

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<sup>34</sup> Lerdahl and Jackendoff, *A Generative Theory of Tonal Music*, 21.

### **Irregular Hypermeter in the Common Practice Era**

Rothstein gives examples of hypermetric manipulation in Common Practice-era music, cases in which inserted material—prolonged lead-ins or improvisatory-like sections such as cadenzas—contradict the expected equal spacing of hypermeasures. In these cases, the metrical pattern is “temporarily detained,” but not overthrown. As Rothstein notes, if the perception of meter required that all beats were equally spaced, as the conventional definition suggests, we would experience common fluctuations in rhythm, such as a *ritardando* or *accelerando*, as the metric framework unraveling. The conventional definition of meter is constantly contradicted by actual musical experience.<sup>35</sup> In tonal music, we reference tempo modifications such as *rubato*, *fermata*, etc., against our internal framework of equally spaced beats—against a “hypothetical continuation of steady tempo.”<sup>36</sup> In reality, listeners are capable of accepting these local fluctuations in meter as momentary alterations of the musical flow. If Lerdahl and Jackendoff’s assertion that listeners are able to more easily accommodate irregularity in metric structure at more extreme metric levels, then hypermetric irregularity should be easier for listeners to process than the measure-level alterations that Rothstein describes.

In the Common Practice era, irregular hypermeter occurs mainly as a result of phrase overlaps or expansions, in which the beginning and ending measures of two consecutive phrases are elided. This creates two consecutive strong measures, interrupting the expected alternation of strong and weak measures and often resulting in a triple hypermeasure where a duple or quadruple hypermeasure would be expected (irregular hypermeter at the *hypermeasure level*), as

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<sup>35</sup> Rothstein, *Phrase Rhythm in Tonal Music*, 41.

<sup>36</sup> Rothstein, 40–41.

in the Beethoven example shown below (see Example 2.4 below). Rothstein refers to this phenomenon as *metrical reinterpretation*.

**Example 2.4.** Metrical Reinterpretation in Beethoven, *Piano Sonata in F minor, Op. 2, No. 1, first movement*, mm. 15-22

The image displays two systems of musical notation for Example 2.4, illustrating metrical reinterpretation in Beethoven's *Piano Sonata in F minor, Op. 2, No. 1, first movement*, measures 15-22.

**System 1 (Measures 15-18):**

- Triple hypermeasure:** 2 (spanning measures 15-16 and 17-18)
- Hyperbeat:** 1 (measures 15-16), 2 (measures 17-18)
- Duple hypermeter:** 1 (measures 15-16), 2 (measures 17-18)
- Hyperbeat:** 1 (measures 15-16), 2 (measures 17-18)

**System 2 (Measures 19-22):**

- Triple hypermeasure:** 3 (spanning measures 19-21)
- Hyperbeat:** 3 (measures 19-21)
- Duple hypermeter:** 3 (measures 19-21), 3 (measures 22-24), 4 (measures 25-28)
- Hyperbeat:** 1 (measures 19-21), 2 becomes 1 (measures 22-24), 2 (measures 25-28), 1 (measures 29-30)
- \*Metrical Reinterpretation:** Indicated by a bracket above measures 22-24.

The musical notation includes treble and bass staves with various notes, rests, and dynamic markings such as *f*, *p*, and *sf*.

## Problems Specific to Twentieth-Century Music

### Interfering Periodicities

We have discussed modifying and expanding the definition of hypermeter to allow for irregularity in both phrase structure and the spacing of hyperbeats. Let us now consider the perception of hypermeter when there are multiple meters implied by the musical surface. What is the *listener's* process in metrically orienting themselves to music with more than one simultaneously implied meter? If we perceive multiple metric layers occurring at once, do we

gravitate toward one, making it the foreground pattern, or do we hear a composite meter based on the alignment of the metric structures of individual lines? Can hypermeter be implied by the *alignment* of multiple rhythmic layers? For example, if two lines of music proceed simultaneously in different time signatures—3/4 and 4/4, for instance—will the listener perceive the alignment of these patterns every twelve beats as a hypermetrical downbeat? Similar to our earlier metric analogy of clock hands aligning at midnight, the alignment of the downbeats of disparate rhythmic layers can create a strong metrical accent.

### **Conclusions**

Building from our expanded concept of hypermeter, now adapted to a broader range of repertoire, I argue that underlying metric and hypermetric structures do exist in rhythmically irregular contemporary music, even though they may seem obscured at the surface level. To support my claim, I will now present three case study examples—compositions by Stravinsky, Adams, and Crumb—in which to explore applications of these analytical approaches. In selecting pieces for this study, I chose a range of works that are representative of different facets of twentieth-century music, while still related to one another through their connection to Classical and Romantic traditions.

Many of the analytical methods I build upon have their origins in Common Practice-era music, and neoclassical Stravinsky seems an appropriate bridge between this music and the modern era. In *Symphony in C*, we find many of the same hypermetric points of interest that have been discussed in reference to Mozart and Beethoven. In his neoclassical works, Stravinsky draws on many aspects of the classical style, such as melody, form, and texture; *Symphony in C* also displays hypermetrical irregularities that are reminiscent of those found in some of the most famous Classical symphonies. John Adams's *Road Movies* is an appropriate second case study, both because it inhabits an important place in the trajectory of twentieth-century music as a post-

minimalist successor to the works of Reich and Glass, and because of Stravinsky's influence on Adams, as noted by scholars and Adams himself.<sup>37</sup> Adams's music is valuable to our study because of the different hypermetrical issues it presents. While questions prompted by Stravinsky are directly related to issues that arise in Classical and Romantic works, in Adams we find hypermeter projected by the alignment of multiple rhythmic layers, creating a composite hypermeter, a phenomenon we do not find in *Symphony in C*. Adams's music is influenced by and aligns with a range of musical styles, such as jazz and African drumming, that did not directly influence Stravinsky's music. These varying influences make Adams representative of a different stylistic branch of contemporary music. George Crumb's *Vox Balaenae*, although written before *Road Movies*, is discussed here after Adams because it offers the most challenges to our analytical perspective. Crumb's music, with its highly experimental approach to timbre and texture, remains Romantic in its phrase-based construction, and is useful for our study because it seems to project meter through its phrase structure alone, even though it occurs in a completely unmetered environment.

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<sup>37</sup> Jonathan Cross, *The Stravinsky Legacy* (Cambridge, UK: Cambridge University Press, 1998), 174.

### **Chapter 3: Stravinsky - Metric Structure in *Symphony in C* (1938–1940)**

#### **Metric Hallmarks of Stravinsky's Music**

Three distinctive features of Stravinsky's music are particularly relevant to this discussion of hypermeter in twentieth-century repertoire: 1) *Metric Conflict*—accent patterns that go against the established meter, both notated and perceived, which create syncopation at both local (metric) and phrase (hypermetric) levels; 2) *Multiple Layers*—the simultaneous juxtaposition of multiple rhythmic layers, each projecting its own metric framework, which sends conflicting perceptual cues and creates metric and hypermetric ambiguity; and 3) *Formal Contrast*—creating formal contrast by alternating between metrically stable and unstable sections.

#### **Analysis of Metric Characteristics in *Symphony in C***

*Symphony in C*, completed in 1940, illustrates all three of the aforementioned rhythmic and metric features. Written during the later part of Stravinsky's neoclassical period (1920–1954), the piece's rhythmic structure is less irregular than some of the composer's earlier works. However, it remains an interesting piece to consider analytically in relation to rhythm and meter, in light of the following three attributes: 1) the opening movement has a clear two-measure (and at times four-measure) hypermetric structure; 2) this hypermetric structure is offset with the notated meter; and 3) the movement alternates between metric stability and instability, both at the large-scale and the local level.

In its neoclassical referentialism, *Symphony in C* dialogues directly with the Classical symphony. The entire work is based on the symphonic form; the first movement, which we will analyze, contains specific references to Mozart's Symphony No. 40 and Beethoven's Symphony No. 5. While it is well known that Stravinsky often drew from eighteenth-century melodic

materials and forms, connections between hypermeter in classical works and Stravinsky's music have not been closely examined. An in-depth comparison of *Symphony in C* and its classical-era predecessors is beyond the scope of this writing, but it is useful to consider the influences of these works on Stravinsky's formal and rhythmic design.

On its surface, the first movement of *Symphony in C* is in many ways a pastiche of some of the most famous symphonies. The repeated note introductory figure strongly alludes to the opening of Beethoven's Symphony No. 5, while the main theme (m. 26) recalls the opening of Mozart's Symphony No. 40, both in the string accompaniment pattern and the main theme's melodic and motivic content. For the purposes of our study, it is interesting to note that both of these works share the hypermetrically ambiguous nature that we will discuss in Stravinsky's first movement.<sup>38</sup>

The movement's introduction begins with a four-measure phrase, consisting of a two-measure *fore-phrase* and a two-measure *after-phrase*. (Rothstein uses *fore-phrase* and *after-phrase* as broader terms for *antecedent* and *consequent* to avoid the specific tonal implications of these latter terms.<sup>39</sup>) The fore-phrase here is a declamatory statement, followed by the after-phrase, a less rhythmically active answer. There are two possible hypermetric interpretations of the opening four-measure phrase (see Example 3.1). The first is to treat m. 1 as a strong measure—a hypermetrical downbeat—and the second measure as hypermetrically weaker. The

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<sup>38</sup> See Weingartner, *Beethoven's Symphonies*, 60, and Lester, *Tonal Music*, for discussion of hypermetric structure of Beethoven Symphony no. 5; and Bernstein (Norton Lectures, *The Unanswered Question*) and Lerdahl and Jackendoff, *Generative Theory*, for discussion of Mozart Symphony no. 40.

<sup>39</sup> Rothstein, *Phrase Rhythm in Tonal Music*, 18.

second interpretation is to treat the first measure as an upbeat, and m. 2 as the emphasized,

**Example 3.1.** Stravinsky, *Symphony in C*, first movement, mm. 1-4

downbeat measure (see Example 3.2). If this passage aligns with the conventional definition of hypermeter as an extension of the metric hierarchy—an alternation of strong and weak beats at the level of strong and weak *measures*, *pairs of measures*, etc.—then the after-phrase of this opening (mm. 3–4) should follow the same strong-weak pattern of emphasis that the first two measures do, with m. 4 being stronger than m. 3. (I argue that the clear two-measure groupings of the movement’s opening support a duple hypermeter here).<sup>40</sup> Conversely, if m. 1 is a

**Example 3.2.** Stravinsky, *Symphony in C*, first movement, mm. 1-4, two hypermetric possibilities

**Analysis 1**

Hypermeasure:	1		2	
Hyperbeat:	1-(downbeat)	2-(upbeat)	1-(downbeat)	2-(upbeat)

**Analysis 2**

Hypermeasure:	1		2	
Hyperbeat:	2-(upbeat)	1-(downbeat)	2-(upbeat)	1-(downbeat)

<sup>40</sup> While the after-phrase is a rhythmic augmentation of the fore-phrase melody, which changes the surface rhythm, the apparent harmonic rhythm remains the same throughout the fore- and after-phrases. In this case, I argue that harmonic rhythm is a stronger indicator of hypermetric structure than surface rhythm.

hypermetric downbeat, m. 3 should be relatively strong compared with m. 4. (As discussed in chapter 1, this alternation between strong and weak elements is one of the factors that helps the listener perceive meter on many levels. However, we do see examples in which this alternation is not present, or is ambiguous at best, as the following passage (mm. 7–14) demonstrates.)

What factors could help guide our analysis here? Let’s consider some of the criteria that can support the perception of hypermeter discussed in chapter 1 (see Table 3.1 for a list of these criteria). The fact that m. 1 begins with a rest, followed by a *crescendo* to strong dynamic and registral accents on the downbeat of m. 2, along with the emphasis created by the downbeat’s slurred eighth-note figure, all make the case for m. 2 being metrically accented. In contrast, while the absence of any perceptual accent on the downbeat of the first measure may make it initially difficult to perceive m. 1 as a metrically accented measure, once the meter has been established by the surface events of the opening four measures, it seems possible to reframe the opening measure as metrically accented.

Criteria	Measure 1	Measure 2
Event on downbeat		X
Dynamic Accent		X
Registrals Accent		X
Accent Created by Slur		X
Possible Metric Accent	X	X

Let’s consider for a moment how this opening section compares to the model of Beethoven’s Symphony No. 5. There are certainly motivic parallels between the openings of the two symphonies, and there appear to be hypermetric parallels as well. Weingartner, Schenker,

and Temperly<sup>41</sup> have discussed the metric ambiguity and hypermetric shifts that occur in this first movement of Beethoven's Fifth; the two openings prompt similar questions as to where the hypermetric emphasis lies. In Beethoven, do we feel an emphasis in the first or second measure? Weingartner, in his 1906 treatise, discusses the challenges faced by conductors in undertaking this movement. The opening measures are organized in two-measure groups, with the hypermetric emphasis falling on the even measures. However, m. 5 disturbs this strong-weak alternation. Weingartner refers to this extra bar at the movement's opening as a riddle that needs to be solved. Although he was writing well before Cone and others began using the term *hypermeter*, he suggests that the answer lies in a hypermetric approach, "if every two bars be taken as one."<sup>42</sup> Weingartner advises conductors to partition the opening into two-measure groups, with the exception of mm. 4–7, which should be treated as a three-measure group, restoring the hypermetric emphasis to its original alignment (see Example 3.7a). (Example 3.7b shows Weingartner's analysis with hypermeasure notations added.) Regardless of where the initial emphasis is perceived, the interpolation of m. 5 causes a hypermetric shift. The opening of *Symphony in C* contains a similar hypermetric shift between mm. 6–11, the resolution of which will be discussed below.

**Example 3.2a.** Weingartner's solution to the opening of Beethoven's *Symphony no. 5, first movement*



<sup>41</sup> Felix Weingartner, *On the Performance of Beethoven's Symphonies* (London: Breitkopf & Härtel, 1906); Heinrich Schenker, *Der Tonwille*. Translated by Ian Bent, edited by William Drabkin (New York: Oxford University Press, 1921); David Temperly, "Hypermetrical Transitions," *Music Theory Spectrum* 30, no. 2 (Fall 2008): 305–25.

<sup>42</sup> Weingartner, *Beethoven's Symphonies*, 60.

**Example 3.2b.** Hypermeter in Beethoven's *Symphony no. 5 in C minor, first movement*, mm. 1-9

Hypermeter:	upbeat	1	2	3	4				
Hyperbeats:		1	2	1	2	3	1	2	1

The musical notation shows a treble clef staff in 2/4 time with a key signature of two flats. The first measure (m. 1) starts with a forte (*ff*) dynamic and contains a half note G4 and a quarter note A4. The second measure (m. 2) contains a half note Bb4. The third measure (m. 3) starts with a piano (*p*) dynamic and contains a quarter note G4, a quarter note A4, and a quarter note Bb4. The fourth measure (m. 4) contains a half note G4. The fifth measure (m. 5) contains a half note A4. The sixth measure (m. 6) contains a half note Bb4. The seventh measure (m. 7) contains a quarter note G4, a quarter note A4, and a quarter note Bb4. The eighth measure (m. 8) contains a quarter note G4, a quarter note A4, and a quarter note Bb4. The ninth measure (m. 9) contains a half note G4. A 'triple hypermeasure' bracket is placed above measures 3, 4, and 5, indicating that these three measures are grouped together as a single hypermeasure.

Returning to Stravinsky, let's now take a broader view and consider mm. 1–14 in their entirety. The instrumental forces of the opening six measures are mostly compartmentalized as two choirs—the winds versus the strings. The strings (together with some of the winds) present the *agitato*, rhythmically charged fore-phrase in mm. 1–2, and then again in mm. 5–6, while the winds answer with the less rhythmically active after-phrases in mm. 3–4 and 7–8. The material throughout the first six measures is clearly grouped into two-measure phrase segments; however, during mm. 7–8, the strings interrupt the winds' second after-phrase, beginning an eight-measure section of overlapping entrances between the strings and the winds (mm. 7–14), in which both the fore- and after-phrase material is developed. In these eight developmental measures, the entrances of the fore-phrases (strings) and after-phrases (winds) are staggered, creating overlapping, two-measure phrase groups (see Example 3.3).

At the movement's opening, the winds and strings each occupy their own rhythmic space—the winds in mm. 1–2 and 5–6, and the strings in mm. 3–4—but as these two phrase segments begin to overlap in mm. 7–8, they increasingly encroach on each other's territory. The varied statements of fore-phrase and after-phrase overlap in a type of *stretto*. This back and forth creates a dialectical tension between the two choirs, which drives the forward momentum of this section to its eventual resolution at the *forte* arrival of m. 15. Because of this overlap between instrumental layers, mm. 7–14 present conflicting hypermetric cues. As Example 3.3 shows, the

**Example 3.3.** Stravinsky, *Symphony in C*, first movement, mm. 1-17, overlapping phrase groups

Moderato alla breve (♩=60)

The musical score is presented in four systems, each with a grand staff (treble and bass clefs). The tempo is Moderato alla breve with a quarter note equal to 60 beats per minute. The key signature is C major.

- System 1 (Measures 1-4):** The strings play a melodic line in the treble clef, starting with a piano (*p*) dynamic and moving to forte (*f*) by measure 2. The bass clef contains a rhythmic accompaniment of eighth notes. Winds enter in measure 2 with a piano (*p*) dynamic.
- System 2 (Measures 5-8):** The strings continue their melodic line. The winds play a block chord in the treble clef. The strings in the bass clef play a rhythmic accompaniment. A *sub.* (subito) dynamic marking is present in measure 6.
- System 3 (Measures 9-12):** The winds play a block chord in the treble clef. The strings in the bass clef play a rhythmic accompaniment.
- System 4 (Measures 13-17):** The winds and strings play a melodic line in the treble clef, starting with a forte (*f*) dynamic. The strings in the bass clef play a rhythmic accompaniment, with a *cresc.* (crescendo) marking in measure 14. The trpt & trb (trumpets and trombones) enter in measure 14 with a mezzo-forte (*mf*) dynamic.

individual instrumental layers begin in a staggered fashion; however, both wind and string phrases increasingly expand and begin to exceed the boundaries of their two-measure sections. These phrases continue to expand and shift, so that by the arrival of m. 15, the two choirs have become more or less aligned.

Let us consider each layer independently of the other. Before tracking the development of the winds' after-phrase, it will help to examine the prototype after-phrase (mm. 3–4) on which subsequent variations are based. If we isolate the after-phrase and consider its metric alignment, m. 4 appears to be metrically stronger. The lack of activity on the downbeat of m. 3, along with the agogic accent created by the longer note value on the downbeat of m. 4, suggest m. 4 as a hypermetric downbeat (see Table 3.2, which lists the factors at work here). If the listener retains this alignment between phrase and underlying hypermeter, then it will likely influence their perception of the wind instruments' subsequent restatements of this material in mm. 7, 9, and 11. If these restatements preserve the hypermetric alignment of the original, prototype after-phrase, then mm. 8, 10, and 12 would be hypermetric downbeats. Beginning at m. 7, however, this alignment is weakened by the shifting of the long note—the goal note of the phrase—to the last quarter note of m. 7, whereas we anticipate it to be on the downbeat of m. 8 (see Example 3.4). This syncopation in m. 7 reduces the hypermetric emphasis on the downbeat of m. 8, and the subsequent iterations of this idea (mm. 9–10, 11–12) place more rhythmic emphasis on the first measure of the phrase (mm. 9 and 11) than on the second measure (mm. 10 and 12). (Both the note events on the downbeat of m. 9 and the syncopations that frame the downbeat of m. 11 provide hypermetric emphasis on the beginnings of these bars.)

Table 3.2. Factors that support the perception of hypermetric emphasis, mm. 3–4

Criteria	Measure 3	Measure 4
Event on Downbeat		X
Agogic Accent		X

Example 3.4. Stravinsky, *Symphony in C*, first movement, mm. 7-14, conflicting hypermetric accents

Expected hypermetric accent: ●  
 Actual hypermetric accent implied by musical surface: ●●

Now let's focus on the strings in the same passage. While the strings initially accent m. 8 as the strong measure of a duple hypermeasure with their lead-in to its downbeat, this accent is then contradicted by the stronger accent on beat two of the same measure, provided by the slurred rising motive and creating uncertainty as to where the metric and hypermetric emphasis lies. As the next string phrase begins (with an extended lead-in beginning in m. 9), it again seems that the first measure of the phrase (m. 10) is accented; however, now this rhythmic activity

continues through to the downbeat of the following measure, emphasizing the beginning of m. 11 with the same slurred rising motive. This rhythm is repeated exactly—with variation in pitch content—leading into m. 13. At this point the strings seem to have settled into a duple hypermeter with mm. 11, 13, and 15 as hypermetric downbeats. As the above discussion illustrates, each instrumental layer—winds and strings—suggests a different hypermetric analysis. Both Examples 3.3 and 3.4 illustrate the two choirs moving from offset entrances in mm. 7–8, to relative alignment in mm 11–14.

Considering both the hypermetric emphasis of the opening four measures and the conflicting hypermetric implications of mm. 7–14, how can we build a larger analysis of the piece's first fourteen measures? Looking at the section as a whole may help us to understand the hypermetric alignment of the movement's opening.

As previously mentioned, there are two possibilities for the opening measures: hearing the first measure as either a hypermetric downbeat or upbeat. Both possibilities are shown in Example 3.5. The choice between these options will influence our perception of the strong-weak alternation of subsequent measures. Based on the clear two-measure phrase segments that we see in the first six measures, and on the two-measure, overlapping entrances of strings and winds in mm. 7–11, a duple hypermetric organization seems likely through much of this opening section. If we consider m. 1 as hypermetrically strong, it is conceivable that a duple hypermeter remains throughout the opening fourteen measures, with a strong-weak alternation continuing through and into the section beginning at m. 15. While this interpretation is mathematically convenient, it has drawbacks. The lack of events on the downbeats of mm. 1 and 3, and the strong dynamic accents on the downbeats of mm. 2 and 4, are both problematic for this analysis. Additionally,

**Example 3.5.** Stravinsky, *Symphony in C*, first movement, mm. 1-16, two hypermetric possibilities

**Analysis 1**  
 Hypermeasure: 

1	2
---	---

  
 Hyperbeat: 1-(downbeat)                      2-(upbeat)                      1-(downbeat)                      2-(upbeat)

**Analysis 2**  
 Hypermeasure: 

1	2
---	---

  
 Hyperbeat: 2-(upbeat)                      1-(downbeat)                      2-(upbeat)                      1-(downbeat)

**Moderato alla breve** (♩=60)

**Analysis 1**  
 Hypermeasure: 

3	4
---	---

  
 Hyperbeat: 1-(downbeat)                      2-(upbeat)                      1-(downbeat)                      2-(upbeat)

**Analysis 2**  
 Hypermeasure: 

3	4
---	---

  
 Hyperbeat: 2-(upbeat)                      1-(downbeat)                      2-(upbeat)                      1-(downbeat)

**Analysis 1**  
 Hypermeasure: 

5	6
---	---

  
 Hyperbeat: 1-(downbeat)                      2-(upbeat)                      1-(downbeat)                      2-(upbeat)

**Analysis 2**  
 Hypermeasure: 

5	6
---	---

  
 Hyperbeat: 2-(upbeat)                      1-(downbeat)                      2-(upbeat)                      1-(downbeat)

**Analysis 1**  
 Hypermeasure: 

7	8
---	---

  
 Hyperbeat: 1-(downbeat)                      2-(upbeat)                      1-(downbeat)                      2-(upbeat)

**Analysis 2**  
 Hypermeasure: 

7	8
---	---

  
 Hyperbeat: 2-(upbeat)                      1-(downbeat)                      2-(upbeat)                      1-(downbeat)

the metric accent created by the strings' entrance leading into m. 8 would align with a hypermetrically weak measure. In this scenario, the majority of events that create strong perceptual accents would fall on hypermetrically weak measures—mm. 2, 6, and 8. One could argue that this analysis exhibits syncopation at the hypermetric level, but it seems unlikely that the pattern of strong and weak downbeats necessary for surface events to be syncopated could be established within the first few measures of the movement, contrasting with the actually perceived stresses.

The alternative interpretation is to consider the opening measure as an upbeat and m. 2 as the hypermetrically strong measure. In this case, the accented downbeats of mm. 2, 6, and 8 are aligned with hypermetric downbeats. Because of the alignment between events on the musical surface and the hypermetric structure, this analysis appears favorable, but it is not without its limitations. A duple hypermeter that begins at m. 2 and continues through the introductory section would also conflict with certain details on the musical surface—specifically the strings' emphases at mm. 11 and 13. This reading would also suggest m. 14 to be hypermetrically strong (because of the continued even-measure accents that this duple hypermeter would create); however, the new section beginning at m. 15 will almost certainly be perceived as a strong hypermetrical accent because of the new section's initiation point supported by the dynamic accents of the *forte* entrances of the horns, celli, and violins.<sup>43</sup>

If we decide to defend this second analysis, how can we reconcile the hypermetric accents at mm. 2, 6, and 8, with those at mm. 11, 13, and 15? Since the overlapping entrances of mm. 7–13 create ambiguity, it seems likely that these measures undergo a hypermetric shift. If

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<sup>43</sup> Lester, *Rhythms of Tonal Music*, see discussion of *Textural Accents*, 28–29.

the duple hypermeter—until now, aligned with even measures—persists, mm. 8 and 10 would both be hypermetrically accented. As discussed above, the strings initially appear to accent m. 10, continuing with their beginning-accented, two-measure phrase grouping. However, the string figure continues through m. 10 to the downbeat of m. 11 and becomes aligned with the accent in the winds' phrase group, also at m. 11 (see Example 3.6). The conventional definition of hypermeter as an *alternation* of strong and weak measures suggests that mm. 10 and 11 cannot both be hypermetrically strong, but that seems to be the case here. In this case, two consecutive strong measures constitute a type of hypermetric irregularity. In this reading, m. 10 acts as a continuation of the opening's duple hypermeter, while m. 11 has a double meaning as a hypermetrically weak bar that—upon arrival—is reinterpreted as hypermetrically strong, creating two consecutive accented measures. Rothstein refers to this phenomenon in Common Practice-era music as *metrical reinterpretation*, wherein a bar expected to be hypermetrically weak is reframed—often because of an elision or overlap in the passage's phrase rhythm—as hypermetrically strong (see Chapter 2, Example 2.4).

**Example 3.6.** Stravinsky, *Symphony in C*, first movement, mm. 9-12, hypermetric shift in string phrase

Strings initially appear to accent m. 10, but continue through to downbeat of m. 11

Strings now in "hypermetric alignment" with winds

Expected hypermetric accent: ●

Actual hypermetric accent implied by musical surface: ●●

A third possible interpretation of this passage is that there is an irregular hypermeter found somewhere in the opening fourteen measures. The notion of irregular hypermeter is supported by the change in hypermetric emphasis associated with the string phrases between mm. 8 and 13. As the strings begin to introduce variations of the fore-phrase, they initially appear to accent the first measure of the two-measure phrase (m. 8), but in retrospect, we see that the emphasis of the phrase shifts to the second beat of m. 8 because of the slurred eighth-note motive. If we follow the placement of this slurred motive beginning at the downbeat of m. 6, it creates an irregular, two-and-a-half-measure hypermeter, spanning from the downbeat of m. 6 to the downbeat of m. 11. This analysis, shown below as Analysis 3 in Example 3.7, incorporates strengths from both of the previous analyses: a duple hypermeter beginning at m. 2 (considering m. 1 as an upbeat), the preservation of a mostly duple hypermeter that aligns with the metric implications of the phrases, and the arrival of m. 15 on a hypermetrically strong downbeat. As we work through this analysis, we increasingly discover the importance of the slurred-half step motive as a marker of metric emphasis.

In the section that begins at m. 15, the rhythms on the musical surface become more regular—both the repeated eighth-note scalar figures and the longer, sustained note values reinforce a duple hypermeter beginning at m. 15. Duple and (and possibly quadruple) hypermeter continues through this section until m. 23. Although this duple hypermeter could conceivably continue through m. 27, the arrival of a new theme group at m. 26 calls for a closer examination of the transition (mm. 23–26) between these two sections.

### **Radical and Conservative Listeners**

How does the listener track these hypermetric shifts? In *Extra Measures and Metrical Ambiguity in Beethoven*, Andrew Imbrie introduces the notion of *radical* versus *conservative* listeners. Imbrie suggests that, when faced with a metrically ambiguous passage, the radical

**Example 3.7.** Stravinsky, *Symphony in C*, first movement, mm. 1-16, third analysis with irregular hypermeasures

**Analysis 3**

Hypermeasure: \_\_\_\_\_ | 1 | \_\_\_\_\_ | 2 | \_\_\_\_\_

Hyperbeat: 2-(upbeat)                      1-(downbeat)                      2-(upbeat)                      1-(downbeat)

*Moderato alla breve* (♩=60)

3 and 4 are irregular, five half-note hypermeasures

Hypermeasure: \_\_\_\_\_ | 3 | \_\_\_\_\_ | 4 | \_\_\_\_\_

Hyperbeat: 2-(upbeat)                      1-(downbeat)                      1-(downbeat)

Hypermeasure: \_\_\_\_\_ | 5 | \_\_\_\_\_ | 6 | \_\_\_\_\_

Hyperbeat: 1-(downbeat)                      2-(upbeat)

Hypermeasure: \_\_\_\_\_ | 7 | \_\_\_\_\_

Hyperbeat: 1-(downbeat)                      2-(upbeat)

listener will adjust more quickly to changes in metric or hypermetric structure, while the conservative listener will prefer to maintain the previous structure.<sup>44</sup> In our example of the shift that occurs just before the introduction of the main theme (m. 26), the radical listener will easily

<sup>44</sup> Andrew Imbrie, "'Extra' Measures and Metrical Ambiguity in Beethoven," in Alan Tyson, ed., *Beethoven Studies* (New York: Norton, 1973), 45–66.

accept the hypermetric shift, quickly jumping to the new hypermetric orientation. Contrarily, the conservative listener will initially retain the previous structure, and hear the main theme as syncopated against the established hypermeter.

### **Out-of-Phase Phrase Structure in Main Theme**

The movement's main theme is presented at m. 26, following the introductory section (mm. 1–25). At first glance the theme is rhythmically straightforward, with clear four-measure phrases that combine into eight-measure phrase groups, but the hypermetric structure is curious—it is out of phase with the notated meter (see Example 3.8). Until this point, the phrase structure and underlying hypermeter has largely been aligned with the *alla breve* time signature; here, however, the theme begins on a metric upbeat (beat two), projecting a *heard* meter that is out of phase with the *notated* meter. What are the factors that contribute to our perception of this offset orientation? The half-step motive that begins the theme provides emphasis, both through its registral separation from adjacent melodic segments, and from the stress given by the dynamic weight of the slurred half step. The motive's positioning at the beginning of the melody lends additional emphasis as a point of initiation. Finally, this motive has already been stated several times during the movement's opening, most often occurring on a downbeat.

The bass line initially supports the theme's out-of-phase rhythmic placement. The alignment of the bass rhythm, along with the theme's accent pattern, suggests a metric accent on the second half note—beat two—of mm. 26 and 28, while there is scarce material on the musical surface to reinforce the notated downbeats. Although the accompanying string pattern begins on the downbeat of m. 26, this moment's emphasis is quickly superseded by the confluence of factors creating a metric accent on beat two of the same measure. The syncopation of these metric accents influences the listener's perception of the passage's hypermeter as well.

**Example 3.8.** Stravinsky, *Symphony in C*, first movement, main theme, mm. 26-38

26

ob:

*p*

vln & vla:

*p*

(vln & vla continue...)

vln:

vcl & cb:

*p*

32

vln & bsn:

fl:

38

If we rebar this section so that the theme begins on beat one, we would find that the first twelve measures—the first complete statement of the theme, and the first half of the second statement—align perfectly with the new notated meter as six duple, or three quadruple hypermeasures (see Example 3.9). The subsequent statements of the theme become more hypermetrically complex, as will be discussed below.

### Hypermetric Destabilization

While the introduction (mm. 1–25) primarily displays duple (and at times quadruple) hypermeter, just prior to m. 26, the introduction's final segment (mm. 15–25) is destabilized by an irregular hypermeter. Listeners initially experience m. 26 as the hypermetrically weak fourth

**Example 3.9.** Stravinsky, *Symphony in C*, first movement, main theme rebarred with duple and quadruple hypermeasures

Quadruple Hypermeasures: | 1 | 2

Duple Hypermeasures: | 1 | 2 | 3

ob: *p*

vln & vla: *p* (vln & vla continue...) vln:

bsn: *p*

fl: *f*

4 | 5 | 6

measure of a four-measure phrase, which is then reframed as the hypermetric downbeat of the main theme. In this regard, m. 26 has a double meaning. The metric ambiguity of m. 26 supports the offset metric placement of the movement's main theme—if the listener perceives the downbeat of m. 26 as hypermetrically strong, it would be more difficult to adjust to hearing beat two as a hypermetric downbeat.

Two possible explanations for the irregular hypermeter leading into m. 26 are: 1) a triple hypermeasure, beginning in m. 23, *extended* by a half note to connect with the beginning of the theme in m. 26; or 2) the duple hypermeter continues with hypermetric downbeats at mm. 23 and 25, but the second hypermeasure (mm. 25–26) is now *shortened* by a half note because of the entrance of the new theme group in m. 26. This next section's syncopated entrance is discussed below.

It is interesting to note here the similarity between the textures found at the introduction of the theme in m. 26 and at the beginning of Mozart's *Symphony no. 40* in G minor (see

Example 3.8a). Bernstein, Cooper and Meyer, and others have noted the first movement of Symphony no. 40 for its hypermetric ambiguity. While the motivic and textural similarity between the two works is readily apparent, there may be a connection in terms of hypermetric design as well. Perhaps *Symphony in C*'s homage to Symphony no. 40 signals that a hypermetric game is about to take place.

**Example 3.9a.** Textural Similarities in *Symphony in C* and *Symphony no. 40 in G minor*

Stravinsky, *Symphony in C*, first movement, mm. 26-27

Mozart, *Symphony no. 40 in G minor*, first movement, mm. 1-3

**Hypermetric Analysis of Main Theme**

The movement's main theme is presented four times, starting at m. 26, with interludes preceding the third and fourth statements. Each statement of the theme is slightly varied, and the subsequent statements follow a trajectory from relative metric clarity to metric ambiguity and back again. The first, second, and fourth statements align with a duple, and possibly quadruple hypermeter, while the third statement—the most metrically (and hypermetrically) ambiguous—

suggests triple hypermeter. The second and third statements follow the same general rhythmic shape of the first and fourth statements; however, because of conflicting activity in the bass line and accompaniment parts, the alignment between these two phrases and the underlying hypermetric structure becomes increasingly difficult to track.

The first statement of the theme is presented as two four-measure phrases—a fore-phrase and an after-phrase—with an underlying duple hypermeter that is out of phase with the notated meter. (Note that here the fore-phrase and after-phrase are four measures each, whereas in the introduction they were two measures each.) The fact that the phrase and hypermeter are out of phase with the *notated* meter is not our main concern. Most interesting for our study is that, due to a hypermetric shift, the theme begins out of phase with the *perceived* meter, which, prior to m. 26, has been aligned with the *notated* meter. The bass rhythm supports the offset duple hypermeter of the opening theme statement (see Example 3.10). Although the bass line becomes less predictable and increasingly syncopated over the course of the theme's first statement, it supports the offset hypermetric structure of the melodic line. In the second statement, the bass becomes increasingly irregular and less aligned with the metric implications of the theme as well as the notated meter.

The abbreviated, second statement of the theme remains aligned with the duple hypermeter and follows the same rhythmic shape as the theme's first statement. A variation on the fore-phrase of the theme is presented (mm. 34–38), followed by a four-measure interlude (mm. 39–42). At this point, the bass line begins to conflict with—rather than support—the hypermetric structure of the theme. Since the bass plays such a strong role in the establishment of meter, this conflict undermines the hypermetric clarity of the melodic line, even as the theme remains aligned with the hypermetric structure of the first statement, creating hypermetric

**Example 3.10.** Stravinsky, *Symphony in C*, first movement, mm. 26–34, first statement of main theme

The musical score for Example 3.10 is presented in three systems. The first system (mm. 26-29) is labeled "1st statement" and "fore-phrase". It features three staves: oboe (ob.), violin and viola (vln & vla.), and bass. The oboe part begins with a melodic line starting on a half note, followed by eighth notes. The violin and viola part provides a rhythmic accompaniment of eighth notes. The bass part has a simple eighth-note pattern. Dynamic markings include *p* (piano) for the oboe and *p* for the strings. Above the staff, a bracket indicates a "Quadruple Hypermeasures: | 1" and another bracket indicates "Duple Hypermeasures: | 1 | 2".

The second system (mm. 30-34) is labeled "after-phrase". It continues the three staves. The oboe part continues its melodic line. The violin and viola part has a section labeled "(vln & vla continue...)" and then a section labeled "vln:". The bass part continues its eighth-note pattern. Above the staff, brackets indicate hypermeasures of 2, 3, and 4 measures.

instability (see Example 3.11). Adding further instability to the perception of hypermeter is a *phrase extension* that bridges the fourth measure of the fore-phrase (mm. 37–38) and the interlude that follows. The general metric instability of this phrase extension—caused by the syncopation of the opening gesture and angular motivic content—creates metric ambiguity that facilitates a hypermetric shift beginning at m. 43. The combination of the strong bass entrance at m. 43, the flute’s melodic lead-in to 43, and the hypermetric uncertainty of the preceding measures, help to frame m. 43 as a point of arrival. Up until this point, the first and second presentation of the theme have been perfectly aligned with duple and even quadruple hypermeter, but during this phrase extension (mm. 38–39), the hypermeter becomes irregular. The fourth hyperbeat is extended to three half notes, which restores the hypermetric alignment with the notated meter during the interlude section (mm. 39–42). The four-measure interlude—homophonic in texture—exhibits both duple and quadruple hypermeter, and, like the fore-phrase,

**Example 3.11.** Stravinsky, *Symphony in C*, first movement, mm. 26-42, second statement of main theme

Quadruple Hypermeter: **2nd Statement** *fore-phrase*

Duple Hypermeter: **1** | **2**

Hyperbeat: 1 2 1 2 - extended hyperbeat

34 ob:

*bass line conflicts with hypermetric alignment of theme*

*interlude* **3rd Statement** *fore-phrase*

**2** | **1**

**3** | **4** | **1**

1 2 1 2 - extended hyperbeat 1 2

39 winds: ob:

bsns: vln & vla: (vln & vla continue...)

strings: vcl & cb:

*phrase now aligned with notated measures* *offset alignment returns*

contains an extended fourth measure (three half notes) that returns the third statement of the main theme to an out-of-phase hypermetric orientation, beginning on beat two and remaining syncopated against the notated meter. An alternative explanation is that the downbeat of m. 43 is a false hypermetric downbeat that becomes reframed when the actual hypermetric downbeat occurs half a measure later (beat 2 of m. 43), making beat 1 of m. 43 a *frustrated* hypermetric downbeat (see Example 3.11).

The third statement of the main theme is the most rhythmically complex and perhaps the most interesting from a hypermetric standpoint. In this statement, accompaniment figures

become increasingly prominent and begin to overtake the main theme melody, overwhelming the listener with conflicting perceptual cues. The bass line remains relatively aligned with the hypermeter by supporting the half-note beat—either aligned with the melody (mm. 43–44), or consistently syncopated in a way that supports its hypermetric orientation (mm. 45–49). The third statement is now compressed, lasting six measures instead of eight, and consists of a three-measure fore-phrase (mm. 43–45) and a three-measure after-phrase (mm. 46–48). The notated m. 46 functions as both the *last half-measure* of the fore-phrase segment, and the *first half-measure* of the after-phrase segment.<sup>45</sup> Two possible analyses for the change from duple to triple hypermeter in this passage are as follows: 1) in this third statement of the theme, the phrase lengths are merely condensed—three measures instead of four; or 2) these shorter phrase lengths are the result of elision, caused by the overlap of phrase segments—the fore- and after-phrases of the third theme statement are actually four-measure phrases that elide with the subsequent phrase. In either case, one possible hypermetrical interpretation of this passage is three consecutive triple hypermeasures, with the last extended by one half note lead-in to the beginning of the fourth statement of the theme, or alternatively, an irregular three-half-note hypermeasure (beginning on beat 2 of m. 49 and continuing through m. 50), followed by a duple hypermeasure (mm. 51–52). In this case the hyperbeat unit modulates from a whole note to a half note and back again (see Example 3.12).

The fourth and final statement of the theme returns to relative metric clarity (see example 3.13). Interestingly, this is the first statement of the theme that is aligned with the notated meter. The hypermeter returns to duple as the fourth statement of the theme begins with an exact

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<sup>45</sup> A similar overlap occurs at m. 49, as the last half-measure of the after-phrase occurs within the same notated measure as the first half-measure of the second interlude (mm. 49–52).

**Example 3.12.** Stravinsky, *Symphony in C*, first movement, mm. 43–53, third statement of main theme

repetition of the first statement of the fore-phrase. Although the bass is syncopated against the underlying hypermeter, it remains consistent in its syncopation and reinforces the hypermetric alignment of the melodic phrase—we hear the bass line as a syncopation against the melody, rather than an independent metric layer. Additionally, here the accompaniment figures are less prominent and remain aligned with the melodic phrase, which also serves to reinforce—rather than conflict with—the theme’s implied hypermeter. The after-phrase (mm. 57–60) begins as a variation of the first statement’s after-phrase (mm. 30–34), but over the course of its four-measure length, it becomes offset metrically and eventually aligns with the syncopated bass rhythm, resulting in a temporary hypermetric shift. The process by which this occurs is a compositional sleight of hand. The same rising eighth-note pattern repeats three times in mm. 57–59 (which is itself a repetition and development of the end of the fore-phrase (m. 56)). The

variation of this melodic figure, first introduced by the oboe in m. 55, is now five quarter notes in length; the violins' restatement of this melody begins the after-phrase proper at m. 57. Because of these alterations in length to the melodic phrase, the oboe's second statement of the melody now aligns with the basses' syncopation (see Example 3.13). The rest on the notated downbeat of m. 59 and the additional orchestration further strengthens this metric displacement; at this point, all instrumental layers reinforce the syncopation. Due to this metric displacement, listeners may perceive the entirety of mm. 59–60 as a duple hypermeasure syncopated against the established hypermeter of mm. 53–57 (m. 58 is the beginning of this displacement). This hypermetric change creates ambiguity leading into the next section—beginning at m. 61—which increases the sensation of metric instability in the following section.

**Example 3.13.** Stravinsky, *Symphony in C*, first movement, mm. 52–62, fourth statement of main theme

The image shows a musical score for Example 3.13, Stravinsky's *Symphony in C*, first movement, measures 52–62. The score is annotated with hypermeter and hyperbeat information. At the top, three levels of hypermeter are indicated: Quadruple Hypermeter (1, 2), Duple Hypermeter (1, 2), and Hyperbeat (1, 2). The '4th Statement' is divided into 'fore-phrase' and 'after-phrase'. A 'possible alternative hearing' is shown for the after-phrase. The score includes parts for flute (fl.), violin (vin.), oboe (ob.), clarinet (cln.), bassoon and contrabassoon (ben & cb.), and violin & viola (vln & vla). A note at the bottom indicates 'melodic phrase aligns with bass syncopation' with an arrow pointing to the start of the after-phrase.

Considering this passage as a whole (mm. 26–60, see Example 3.14), each one of the theme's four presentations has its own unique underlying hypermeter. The first statement (mm. 26–34) features clear duple and quadruple hypermeter; the theme is offset by a half note from the established hypermeter of the previous section, but there is little ambiguity in how the theme and hypermetric structure align. The second statement (mm. 34–43) consists of a variation of the fore-phrase and a brief interlude, and features a modified duple and quadruple hypermeter—the

**Example 3.14.** Stravinsky, *Symphony in C*, first movement, mm. 26-60, four statements of main theme with hypermeasures

**1st Statement - duple and quadruple hypermeter**

Quadruple Hypermeter: | 1 *fore-phrase* | 2

Duple Hypermeter: | 1 | 2 | 3

Hyperbeat: 1 2 1 2 1 2

26  $\text{♩} = 66$  ob: *p*

vln & vla: *p* (vln & vla continue...)

vcl & cb: *p*

**2nd Statement - quadruple and duple hypermeter with extended hyperbeats**

after-phrase | 1 *fore-phrase* | 2

Hyperbeat: 1 2 1 2 1 2 - extended

32

vln & bsn: fl: *p*

vcl & cb: *p*

**3rd Statement - triple hypermeter with extended hyperbeats**

interlude | *fore-phrase* | 2

Triple Hypermeter: | 1 | 2 | 3 | 4

Hyperbeat: 1 2 1 2 - extended 1 2

38 winds: ob: *p*

bsns: vln & vla: (vln & vla continue...)

strings: vcl & cb: *p*

Example 3.14. continued

*after-phrase*

3 - extended

1 2 3 1

(4) (4)

45

fl: #

vln:

vln & vla:

vcl:

**4th Statement - duple and quadruple hypermeter**

*interlude*

Quadruple Hypermeter: 1 *fore-phrase*

Duple Hypermeter: 1

2 3 - extended hyperbeat 1 2

50

fl: #

bsn & cb:

*after-phrase*

2

1 2 1 2

55

vln:

ob:

cl:

vcl & cb:

*sf*

*sf*

*sf*

fourth measures of both the fore-phrase (m. 37–38) and the interlude are extended by a half note. Though the third phrase is the most metrically ambiguous of the four theme statements, it is underpinned by a clear triple hypermeter throughout its two abbreviated phrase segments (mm. 43–46 and 46–49), and its interlude (mm. 49–52) that leads into the next statement of the theme.

The final measure of the interlude's triple hypermeasure is again extended by a half note, which restores hypermetric alignment with the notated meter. The final statement of the theme is once again underpinned by duple and quadruple hypermeter. The fore-phrase (mm. 53–56) is hypermetrically unambiguous, but the after-phrase (mm. 57–60) undergoes a hypermetric shift that aligns the phrase with the syncopated bass rhythm and creates a patch of metric instability leading into the next section, which begins at m. 61.

### **Alternation Between Metric Stability and Instability**

This passage (mm. 26–60) illustrates another rhythmic characteristic of this movement—a pattern of alternation between metric stability and instability. After the main theme's initial fore-phrase presentation (mm. 26–30), the after-phrase becomes less metrically stable. While it remains oriented to the same out-of-phase metric placement as the fore-phrase, the surface rhythm activity becomes more constant during the after-phrase (mm. 30–34). The texture also becomes more complicated as the melodic figure's overlapping statements are passed between instruments, and the bass rhythm becomes irregular underneath this development of the initial melodic statement. Though the introduction of these variations in both the melodic phrase and the bass rhythm act to destabilize the metric framework here, the listener can remain oriented because the meter has been so strongly established in the theme's four-measure fore-phrase. At the theme's second statement in m. 34, the melodic phrase returns with slight variation, while the accompanying strings reinforce the phrase's metric position with their slurred emphasis on beats 1 and 2 (see mm. 34–37). The metric position is reinforced in spite of the fact that the basses continue to contradict the metric orientation of the melody and create phrase-level syncopation against the theme's hypermeter. Over the course of these four statements, we see a progression from metric stability in the first presentation of the theme, to increasing instability in the second and third statements, to a return to stability in the fourth and final presentation of the theme. The

shifting along this spectrum creates formal contrast that reinforces the larger design of the movement.

## Chapter 4: John Adams – Interfering Periodicities in *Road Movies* (1995)

### Interfering Periodicities

John Adams has long used metric conflict in his music. Kyle Gann observes that the layering of multiple rhythmic strata, or “interfering periodicities,”<sup>46</sup> is a driving force in Adams’s music, including in compositions such as *China Gates*, *Shaker Loops*, and *Lollapalooza*. An early experimenter with cyclical patterns, Adams often employs layers of differing lengths to create interesting textures. (Gann observes that minimalism, although sometimes criticized for its “simplicity,” has allowed composers access to new kinds of rhythmic complexity.)

In the first movement of *Road Movies*, the violin line develops as a series of repeated, gradually transforming rhythmic motives. Each progressive change suggests a metric shift—one that is often at odds with the meter of the piano part (see Example 4.1 below, in which the violin line suggests 9/16 while the piano remains in 3/4). Because of these changes, the violin phrases regularly cross over notated bar lines, creating an out-of-phase relationship between the piano and violin. Put another way, the violin line often creates syncopation against the piano’s relatively consistent metric pulse. In this context—one in which there are constantly shifting simultaneous metric layers—how does the listener perceive, identify, and track hypermetric organization? This is one of the key questions I will explore in this chapter.

Two aspects of this piece will help to answer this question. First, I will explore the hypermetric implications of each individual instrumental layer. As discussed in chapter 2, there are two levels at which irregular hypermeter can occur: the *hyperbeat* level and the

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<sup>46</sup> Kyle Gann, “Fascinating Rhythm: John C. Adams as Metametric Pioneer” (keynote address, “Inside the (G)earbox: John Adams @ 70” symposium, UCLA, March 4, 2017).

Example 4.1. Adams, *Road Movies*, first movement, mm. 7-9, multiple metric layers

The image displays a musical score for Example 4.1, showing multiple metric layers. The top staff is a violin line, and the bottom two staves are piano accompaniment. The violin line features a complex rhythmic pattern with a 9/16 time signature indicated above the first measure. The piano accompaniment consists of a steady bass line in the left hand and a more active treble line in the right hand, with a 3/4 time signature indicated above the first measure. The score is set in the key of D major, as indicated by the two sharps in the key signature.

hypermeasure level. In *Road Movies*, the violin line suggests the former type of altered hypermeter—irregular spacing between hyperbeats results from the violin’s changing phrase lengths, which are not aligned with notated measures (in this case there is a conflict between notated and heard meter). Second, I will discuss how a listener can perceive hypermeter when considering the violin and piano lines together. I posit that when hearing the alignment of these multiple metric layers—or interfering periodicities—the listener can create a composite hypermeter.

### Stravinsky’s Influence

Adams is undoubtedly influenced by Stravinsky’s music, but how do the hypermetric structures found in *Road Movies* differ from those found in *Symphony in C*? We see some of the same metric and hypermetric characteristics in both pieces, such as irregular hypermeasures, shifting hypermeter, and transitions from metric clarity to ambiguity; however, *Road Movies* uses hypermetric transformation as an ongoing process—it becomes a part of the narrative of the movement—while in *Symphony in C*, hypermetric shifts seem to be isolated, compartmentalized events. In *Symphony in C*, these shifts create ambiguity in a given section of music, while *Road Movies* draws out these metric shifts gradually, as a part of the movement’s developmental arc.

Stravinsky's music metrically pivots nimbly from point to point, while Adam's music makes slow, intentional movements. If we compare the occurrences of hypermeter across the two works, the Adams is unique in its inclusion of composite hypermetric structures. Additionally, we find the influence of popular music in Adams's music; these layered structures are reminiscent of those found in jazz, African drumming, and other types of polymetric music. In Adam's interfering periodicities, we hear the overlapping rhythmic patterns of a pastiche of contemporary music styles.

### **Listener's Perception of Foreground**

The interfering periodicities in *Road Movies* prompt questions about finding stable and sustained metric and hypermetric patterns within it. How long will a listener retain an established metric framework? How long will we tap our foot to the beat before the metric foundation erodes under the pressure of contrary perceptual cues? As discussed in chapter 1, once established, a metric or hypermetric pattern tends to stay with the listener until contradictory cues on the musical surface overwhelm the pattern. Additionally, when there are two metric patterns simultaneously present, which one is perceived as the foreground, and what determines this? In the first movement of *Road Movies*, the focus gradually shifts back and forth from violin to piano, and each instrument occupies a place in the rhythmic foreground at various points in the movement. At what threshold does one part appropriate the metric foreground from the other? This question is key to our analysis; the pattern the listener perceives as foreground will influence the hypermetric organization they hear.

### **Hypermeter as a Composite of Multiple Rhythmic Layers**

The first movement of *Road Movies* presents multiple rhythmic strata; as Gann asserts, these strata are a core compositional device in Adam's music. We have discussed how the alignment of multiple layers of pulses plays an important role in the creation of meter. On a

larger scale, can hypermeter be implied by the alignment of multiple phrase layers? For example, if two lines of music proceed simultaneously in different time signatures, for instance 3/4 and 4/4 (see Example 4.2), will the listener perceive the alignment of these patterns every twelve beats as a hypermetrical downbeat, in the same way that a listener will perceive the alignment of multiple metric subdivisions as measure-level downbeats? (See Example 4.3.)

**Example 4.2.** Hypermeter implied by multiple meters

The image shows two staves of music. The upper staff is in 3/4 time, with measures numbered 1, 2, 3, and 1. The lower staff is in 4/4 time, with measures numbered 1, 2, 3, 4, 1, and 2. A vertical dashed line is drawn at the end of the first measure of the 3/4 staff (the fourth measure of the 4/4 staff), labeled 'hypermeterical downbeat' with a downward arrow. This indicates that every 12 beats (4 measures of 3/4 and 3 measures of 4/4) align to form a larger hypermetrical unit.

**Example 4.3.** Meter implied by multiple or polymetric subdivisions

The image shows two staves of music. The upper staff has a 3-beat subdivision with measures numbered 1, 2, 3, 1, 2, 3. The lower staff has a 4-beat subdivision with measures numbered 1, 2, 3, 4, 1, 2, 3, 4. A vertical dashed line is drawn at the end of the first 3-beat subdivision (the fourth measure of the 4-beat subdivision), labeled 'metric downbeat' with a downward arrow. This indicates that the alignment of these subdivisions implies a metric structure.

### Movement Overview

The first movement of *Road Movies* develops as a series of continuously evolving and expanding violin phrases, composed of short, rhythmic motives. The movement proceeds in this way, the slowly expanding and contracting phrases transforming the metric fabric as the music develops. The violin motives are predominantly short segments, ranging in length from two

sixteenth notes to three quarter notes. Meanwhile, the piano's rhythmic character is similar to a *moto perpetuo*, predominantly maintaining a constant stream of sixteenth-note figures, which allows the violin to move freely and in a way that influences and ultimately structures the perceived meter. The piano's regular patterns provide a static background against which the listener can track the development of the violin's metric organization.

### Metric Shifts

The movement begins with *ostinati* in both the violin and piano that outline two separate but complimentary metric patterns. The piano begins with a repeated four-sixteenth-note pattern that indicates a quarter-note beat, while the violin line suggests a dotted-quarter-note beat with its opening gesture spanning six sixteenth notes (see Example 4.4). This metric duality is common in many music styles, often expressed by shifting the emphasis from the quarter-note pulse to the dotted-quarter-note pulse, as in a 3/4—6/8 *hemiola*. By opening the movement with this metric overlap, Adams signals that there may be more metric friction to follow. The first shift in metric emphasis comes between mm. 7–9. The violin first presents a grouping of nine

**Example 4.4.** Adams, *Road Movies*, first movement, beginning

The musical score for Example 4.4 shows the beginning of the first movement of *Road Movies* by John Adams. It is written for Violin and Piano. The tempo is marked as quarter note = 106. The music is in 4/4 time, with a key signature of one sharp (F#). The violin part starts with a dotted quarter note followed by eighth notes, marked *mf*. The piano part starts with a steady stream of sixteenth notes, also marked *mf*. The score shows the first nine measures, with a metric shift occurring between measures 7 and 9.

sixteenth notes (m. 7) and then twelve sixteenth notes (m. 9), while the piano part shifts slightly in m. 7 to create a 6/8 pulse (see Example 4.5). Already, within the first ten bars, we have heard

three distinct meters: 3/8, 6/8, and 9/16. How do we understand this? Can we follow all of these conflicting metric signals at the same time? In order to create a metric framework to follow, listeners can create a composite of these signals, or—perhaps more likely—consciously or unconsciously choose one instrument to follow.

**Example 4.5.** Adams, *Road Movies*, first movement, mm. 7–9

The musical score consists of three measures. The top staff (violin) features a melodic line with eighth and sixteenth notes, including slurs and ties. The bottom staff (piano) is divided into two parts: the left hand plays a steady quarter-note bass line starting on F# (the first line), and the right hand plays a more complex pattern of eighth and sixteenth notes. The key signature has one sharp (F#), and the time signature is not explicitly shown but implied by the notation.

### Factors in Creating Metric Frameworks

Let us consider the factors at play as listeners work to create these metric frameworks.

The opening piano part outlines a clear quarter-note beat, but the piano's lack of emphasis at a higher hierarchical level does not provide the listener with additional information to make metric conclusions beyond the quarter-note beat. Perhaps this is intentional on the part of the composer—the lack of higher-level metric organization in the piano leaves the violin line space for more metric freedom. In fact, without the addition of the violin melody, it is possible that the listener would begin to hear the metric accent of the opening piano *ostinato* as beginning on the low F# in the left hand. But in combination with the violin, the two layers align to give emphasis to the notated downbeat of each measure (see Example 4.4 above).

The grouping of the violin figure projects metric structure in two ways. First, through regular points of initiation,<sup>47</sup> the initial motive suggests a repeated grouping of three eighth notes. (The piano's first note—the first point of initiation in the piece—may influence the listener's perception; however, the piano's static sixteenth-note texture lacks the regular points of initiation of the violin.) Second, this grouping is reinforced by the slurred half-step gesture that begins the motive—the dynamic weight of the slur gives further strength to the initiating gesture. In m. 3, with the addition of the E4, the pattern begins to suggest 6/8 (that is, two groups of 3/8). In m. 7, the melody continues to transform and now begins a repeated ascending pattern spanning a perfect fourth. The initiating C#4 of this pattern marks a point of emphasis as a registral extreme. This new motive spans nine sixteenth notes, implying a meter of 9/16 (see Example 4.5 above). As the violin begins this new motive in m. 7, the piano part makes its first change—the right hand introduces a repeated pattern lasting three eighth notes (suggesting a dotted-quarter-note beat), while the left hand continues its repeated quarter-note pattern (emphasizing quarter-note beats), together producing a composite 3/4-6/8 pattern.

### **Composite meter in violin and piano**

At this point in the opening (mm. 7–9), the music supports three perceivable metric layers (although I would argue that the listener perceives the right hand of the piano and the violin most strongly because they are the newly introduced elements).<sup>48</sup> Already at this early stage in the piece, the musical surface continually shifts, creating a lack of stability and space for multiple metric interpretations. Because of this, the listener must choose which instrument to follow. The

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<sup>47</sup> Lerdahl and Jackendoff cite points of initiation as important perceptual input in the delineation of grouping structure. In *A Generative Theory of Tonal Music*, 17.

<sup>48</sup> Lester, *The Rhythms of Tonal Music*, 28–29.

piano's arpeggiation of a D major 7th chord outlines a clear quarter-note beat, while the violin motive suggests either 3/8 or 6/8 (see Example 4.4 above). But it is the alignment of these two metric layers every three beats that causes a metric accent at the downbeat of every notated measure. The listener must make a choice between hearing the composite metric pattern as 6/8 or 3/4, depending on whether they are following the meter of the violin or the piano part. One could argue that, because the listener hears the piano enter one beat before the violin, they will give the piano precedence over the violin line, but I assert that the violin line clearly establishes the meter here. The violin line more strongly exhibits factors associated with the establishment of a metric pattern—the strong emphasis every third eighth note, provided by the slurred couplet figure, acts as a perceptual accent that aligns with a 3/8 or 6/8 meter—while the piano's relatively undifferentiated sixteenth-note texture does not provide strong perceptual cues for establishing 3/4.

### **Radical versus Conservative Hearings**

The opening alignment of the piano and violin establishes a metric framework that stays with the listener, against which the proceeding metric shifts are perceived as syncopations. Whether they are following the piano or the violin, how long does the listener retain this initial framework, and how will the framework they choose affect their perception of hypermeter? To address this, we can again invoke Imbrie's consideration of radical versus conservative hearings.<sup>49</sup> More flexible or "radical" listeners will typically follow subtle metric changes, allowing their internalized beat to adjust to each shift in metric emphasis, while more conservative listeners will preserve the opening metric framework as long as possible. (I would argue that, in this case, regardless of whether the listener takes a radical or conservative approach,

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<sup>49</sup> Andrew Imbrie, "Extra Measures," 45–66.

the perceptual cues near m. 22 conflict with and ultimately overwhelm the piano's opening 6/8 pulse.)

In m. 7, the listener hears conflicting perceptual cues that can produce different interpretations. The piano left hand suggests 3/4, while the right hand introduces a new pattern in groupings of three eighth notes, suggesting 6/8. The addition of the violin line suggesting 9/16 results in three separate yet simultaneous metric levels (see Example 4.5, duplicated below). Which does the listener hear as the foreground, and what—if any—is the resulting hypermeter? Any hypermetric organization may depend on which instrument the listener favors. If the listener has established the piano rhythm as the foreground meter, they will hear the violin phrase in syncopation against the piano line. The beginning of each slurred couplet in the violin accents every third sixteenth note in the piano line, projecting a four-against-three pattern. If the listener has tracked the violin pattern as the primary meter, it is possible they will hear this same passage in 9/16, as the violin phrase suggests. An alternative reading is to hear the violin in 9/16, but with an emphasis on the second sixteenth note of each couplet (see Example 4.5a). This occurs because of the tendency to hear the second note in the two-note rhythmic pattern as the strong beat. This can be attributed to longer note values being perceived as perceptual accents, as listeners tend to metrically orient themselves to longer note values as strong beats. (Even though the two sixteenth notes of each couplet are equal in length, we perceive the second sixteenth as longer, because we include the sixteenth-note rest that follows it as part of the previous note's length, internalizing a pattern of short long, short long, etc.) The listener's metric reading of this measure—which part becomes the foreground—is important to what follows; the pattern that the listener establishes here will influence their interpretation of subsequent measures.

**Example 4.5.** (duplicated) Adams, *Road Movies*, first movement, mm. 7-9

**Example 4.5a.** Adams, *Road Movies*, first movement, mm. 7-9, alternative metric emphasis of violin line

## Hypermetric Analysis

Can a listener perceive a hypermetric structure among these constantly changing and competing phrase lengths? Our modified definition of meter from chapter 2 can guide our analysis here. Even in the absence of equally spaced phrase initiation points, the violin line projects a periodicity because of its recurring motivic elements, which helps the listener track the expanding and contracting phrases. The first movement's opening measures establish a duple hypermeter (see Example 4.6); however, when the violin begins to change at m. 7 to a phrase that implies 9/16, the hypermeter becomes less clear. The duple hypermetric structure of the

**Example 4.6.** Adams, *Road Movies*, first movement, mm. 1-6, metric patterns of violin and piano, and resultant hypermeter

The image displays a musical score for the first movement of *Road Movies* by John Adams, measures 1 through 6. The score is presented in two systems. The top system covers measures 1-2, and the bottom system covers measures 3-4. Above the first system, a hypermeter diagram shows a sequence of hyperbeats: 1 (&) 2 (&) 1 (&). The tempo is marked as  $\text{♩} = 106$ . The violin part is in treble clef, and the piano part is in bass clef. Both parts are marked *mf*. The violin part features a slurred half-step motive. The piano part consists of a steady eighth-note accompaniment. The hypermeter diagram is placed above the violin staff, with vertical lines indicating the hyperbeat boundaries. The piano part is aligned with the violin part, showing the relationship between the two parts.

opening six measures will influence the listener's perception of meter in mm. 7–9. Drawing again from Imbrie, the radical hearing in this case would be to quickly abandon the established hypermeter and begin tracking the violin's 9/16 meter, while the conservative hearing would be to preserve the established hypermetric structure of the first six measures and hear the violin phrase as a syncopation against the piano and the established hypermeter. Even though the violin line exhibits stronger metric characteristics (regular points of initiation, dynamic weight of the slurred-half step motive), the established hypermeter may supersede those characteristics in the listener's perception of meter. Once established, a metric pattern remains and resists change, even when met with strongly contradictory evidence.<sup>50</sup>

<sup>50</sup> Lerdaahl and Jackendoff, *A Generative Theory of Tonal Music*, 17.

An alternative reading of this passage lies somewhere in between radical and conservative hearings. While initially preserving the established duple hypermeter, if the listener begins to track the syncopation of the violin phrase, the alignment of these two patterns may establish a new higher-level hypermeter. In m. 7, the violin phrase spans nine sixteenth notes, while the piano accompaniment figure repeats every six sixteenth notes, which results in the two patterns aligning every eighteen sixteenth notes (or every three dotted-quarter notes) (see Example 4.7). The alignment of multiple rhythmic layers in this passage creates a metric accent, which, in turn, creates either a duple or triple hypermeter, depending on which phrase the listener preferences. If the listener tracks the violin, the duration of nine sixteenth notes acts as the hyperbeat and suggests two *duple* hypermeasures; if they follow the piano, the dotted-quarter note is the hyperbeat, creating two *triple* hypermeasures. In either case, the last hyperbeat of the second hypermeasure of this group (mm. 8–10, or hypermeasure 5 in Example 4.8) is extended. Example 4.8 shows a possible hypermetric analysis of the first sixteen measures.

This composite hypermeter, however, does not remain for long. The violin's fourth repetition of this statement is extended in mm. 9–10, first to twelve sixteenth notes and then to

**Example 4.7.** Adams, *Road Movies*, first movement, mm. 7-9, composite hypermeter

Possible Hypermetric Downbeat

The image shows a musical score for measures 7, 8, and 9. The top staff is a violin line in treble clef, and the bottom staff is a piano accompaniment in bass clef. Above the violin staff, there are two hypermetric groupings labeled '1' and '2'. The first group '1' covers measures 7 and 8, and the second group '2' covers measures 8 and 9. A downward arrow labeled 'Possible Hypermetric Downbeat' points to the beginning of measure 8. Above the piano staff, there are three hypermetric groupings labeled '1', '2', and '3'. The first group '1' covers measures 7, 8, and 9, the second group '2' covers measures 8 and 9, and the third group '3' covers measure 9. The piano accompaniment consists of a steady eighth-note pattern in the left hand and a dotted-quarter note pattern in the right hand.

Example 4.8. Adams, *Road Movies*, first movement, mm. 1-16, composite hypermeasures

Duple Hypermeter (hyperbeat = ♩)

Hypermeasure: 1 | 2

Hyperbeat: 1 (&) 2 (&) 1 (&)

♩=106

Violin

Piano

4 2 (&) 3 1 (&) 2 (&)

Triple Hypermeasure (hyperbeat = ♩) Triple Hypermeasure w/extended 3rd hyperbeat (hyperbeat = ♩)

4 5

7 1 2 3 1 2 3 - extended hyperbeat

Violin phrase is extended...

Duple Hypermeasure (hyperbeat = ♩)

10 16 7 1 2 1 2

New pattern begins

Example 4.8. continued

sixteen sixteenth notes. Meanwhile, the piano maintains its metric pattern of six sixteenth notes, spanning a dotted-quarter note (see Example 4.8). Against the piano's consistent and static figuration in this section, the listener can easily follow the expansion of the violin line. During mm. 10–12, the four-quarter-note phrase of the violin establishes the foreground meter (hypermeasures 6–7), as points of metric alignment lessen in frequency and the interaction between the two layers becomes difficult to track. The gradual expansion of the violin phrases projects shifts in the hyperbeat across the opening (mm. 1–16), from dotted-half note to dotted-quarter note to half note, which act as *hypermetric modulations*.

Once the half-note hyperbeat is established (mm. 11–12), it remains through the next three hypermeasures, aligning with the expanding and contracting violin phrases. In mm. 13–16, the violin line becomes less continuous, taking more space between statements. The first of a new series of melodic phrases (mm. 13–14) lasts four quarter notes, which—reinforced by the piano's two-quarter-note pattern—creates a duple hypermeasure. In the subsequent measures

(mm. 14–16), the violin line contracts to three-quarter-note phrases, which, through its alignment with the piano's two-quarter-note pattern, suggests a triple hypermeasure that encompasses two statements of the new violin phrase.

Can a listener perceive such a complex and dynamic hypermetric structure? I would offer a moderate response. When the violin and piano phrases intersect, the listener can often hear the alignment of initiation points as local-level structural accents and can indeed perceive the underlying hypermeter. Contrarily, there are also moments of intersection that lack supporting factors such as registral accents or textural changes, which listeners do not perceive with the weight of a hypermetric downbeat. In my experience, many of the hypermetric structures that we have discussed in the movement's opening are clearly audible, while others require an effort to perceive; these structures seem easier to comprehend near the beginning of the piece and become increasingly more opaque, as both the texture and interactions between metric layers become more complex.

## Chapter 5: George Crumb – Phrase Structure as Hypermeter in *Vox Balaenae* (1971)

### Hypermeter in Non-Metered Music

Can non-metric music create a hypermetric structure? On the surface, this question seems inherently contradictory. Meter acts as a framework against which we mark events; because hypermeter is an extension of the *metric* hierarchy, it seems logical to say that it cannot exist without meter. Hypermeter does have some characteristics that can function in a piece irrespective of meter, however, such as regularly recurring phrase initiation points. In the absence of established meter, can phrase suggest hypermeter, through the initiation and repose points of phrases, phrase shape, and conclusion points?

### Meter in Crumb's Music

George Crumb's music presents a challenge to metric and hypermetric analysis, as it often eschews notated meter and is metrically free, or uses an ambiguous metric framework. However, Crumb's music does string together phrases in a way that can suggest metric and hypermetric patterns. In the introductory *Vocalise* section of *Vox Balaenae*, the clear phrase structure of the opening flute passage implies *hypermetric* structure, even in the absence of notated meter.

How can a strictly unmeasured and unmetred passage project hypermeter, and how can we approach hypermetric analysis in such a passage? We think of meter as a framework; the listener requires a structure in order to reference musical events against it. Even in the absence of meter, we perceive time passing. This perception does not always manifest in actively counting measures or quarter-note beats, but we can roughly measure whether, for example, a sound is occurring every 15–20 seconds. When we listen to unmetred music, can we measure it against our internal sense of time? As we consider *Vox Balaenae*'s opening flute passage, we must make

a leap. In attempting to understand the large-scale metric organization of an unmetered piece of music, we must loosen some of the rules that have guided our discussion up to this point. In the previous case study examples by Stravinsky and Adams, meter and hypermeter were relatively straightforward. We discussed some of the interesting and, at times, complex hypermetric issues that arise in these works, but we can understand what happens in these pieces as events related to a grid. We have no such grid to guide our analysis of Crumb's music and so must somehow create a structure to use as a reference, perhaps through a type of cross-domain mapping, to borrow a term from cognitive linguistics. Is it possible to understand musical gesture and phrase as conveying physicality? Can these elements embody a space that we can measure in the absence of an internalized *beat*? I argue that we can internalize a sense of meter—and even hypermeter—without the projected structure of clockwork-like strata of rhythmic layers. In a metered environment we can find mathematically proportional relationships between all metric levels, but here we must jettison these relationships and return to basic musical elements. Just as Lerdahl and Jackendoff describe how musical events create metric structure, projecting and establishing the framework against which the listener references subsequent events, in the unmetered environment of *Vox Balaenae*, we can imagine individual gestures and phrases projecting their own structural space. If we can understand unmetered language—prose as opposed to poetry—as occurring in time and occupying a rhythmic space, we should be able to understand the positioning in time of unmetered gestures and phrases, and create from this an internalized sense of meter and hypermeter.

### **Overview of *Vocalise***

*Vox Balaenae* (1971), for electric flute, electric cello, and electric piano, contains both metered and unmetered passages. The introduction, a soliloquy-like passage for flute—titled *Vocalise (...for the beginning of time)*—is marked “Wildly fantastic; grotesque,” followed by a

tempo marking of dotted-sixteenth note = 64, and is notated without meter. This passage alternates between held note events indicated by a given time measurement above the note—5 seconds, for example—and beamed segments. While this section of the score doesn't contain bar lines, some segments are beamed together in a way that, along with the dotted-sixteenth tempo marking, suggests compound meter. The first phrase, for example, contains the equivalent of ten dotted-sixteenth-note beats notated under one beam (see Example 5.1).

**Example 5.1.** Crumb, *Vox Balaenae*, beginning

**Vocalise (..for the beginning of time)**  
Wildly fantastic; grotesque (♩.=64)

play  
Electric Flute  
sing

5  
\* "sing-flute"  
*ffzpp sub.* *molto f sempre*

**Structure of *Vocalise***

At first glance the *Vocalise* section can be divided into six parts—six periods—comprised of either two or three phrases each (see Example 5.2 in Appendix A). The conventional understanding of a *period* in tonal music is tied to both harmonic motion (consider the textbook parallel period, in which the fore-phrase/antecedent ends with a half cadence and the after-phrase/consequent closes with a full or authentic cadence) and melodic motion (parallel versus contrasting periods). Although this introductory section does not exhibit functional harmonic progression, the periodic structure of the *Vocalise* section is based on melodic as well as timbral aspects of phrase.

### Phrase Analysis by Timbre

Just as initiation points of melodic segments can help to project meter and delineate phrase boundaries, timbre helps to determine the structure of the individual periods and mark the boundaries of their component phrases and subphrases. The *Vocalise* alternates between two extended-technique timbral characters, described in the score as *sing-flute*, in which the performer “sings while playing! The sung tones and flute tones should be perfectly balanced,” and *through-the-flute*, in which “the lips cover the mouthpiece so that all tone is projected through the tube,”<sup>51</sup> calling for the flutist to hum while rapidly changing fingerings. Each period is comprised of both *sing-flute* and *through-the-flute* phrases and gestures. As the arc of the *Vocalise* unfolds, flutter-tongue and glissandi are introduced as well (beginning in the fourth period).

The first period begins with a *sing-flute* fore-phrase, which lasts approximately 15 seconds, followed by a shorter, *through-the-flute* after-phrase, lasting approximately 7 seconds.<sup>52</sup> Over the course of the *Vocalise*, these proportions begin to shift, with the after-phrases increasing in length while the fore-phrases becomes truncated and fragmented. As the *Vocalise* section progresses, the after-phrase material plays an increasingly prominent role, displacing the fore-phrase material and shifting the internal balance of the periods from the more-stable tonal timbre of the *sing-flute* sections, to the weaker timbre of the *through-the-flute* sections.

The progression from fore-phrase-dominant to after-phrase-dominant periods creates a progression from stability to instability throughout the section. During the first period, the

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<sup>51</sup> Performance notes in score. George Crumb, *Vox Balaenae*, for Three Masked Players (New York: C.F. Peters Corporation, 1971), 6.

<sup>52</sup> Phrase timings vary slightly depending on performance. Timings referenced here correspond to information given in the score.

listener perceives the fuller timbre of the *sing-flute* fore-phrase material as more stable, but as the after-phrase becomes more prominent, the muted, thinner timbre of the *through-the-flute* section provides less sonic stability. Additionally, as the *Vocalise* progresses into increasingly fragmentary phrases, the internal structure of the periods becomes less reliable, which contributes to the progression from stability to instability. This formal device helps the listener track the development of the section and mark the return of each fore-phrase, which contributes to the narrative arc of the opening.

*A note on phrase partitioning:* In order to accommodate the irregularity and increasing fragmentation of these six periods, I have determined the divisions of phrases and subphrases largely by the way that the music feels. For example, the first period is partitioned into phrases using only timbre as a guide—the first phrase consists entirely of *sing-flute* fore-phrase material and the second phrase entirely of *through-the-flute* after-phrase material—while the third period's phrases contain subphrases of both *sing-flute* and *through-the-flute* material.

### **Period Structure**

The shift in timbral emphasis happens gradually and in parallel with increased fragmentation of phrase structure over the course of the *Vocalise*. The second-period fore-phrase remains the same length as the fore-phrase in the first period, but the after-phrase material in the second period becomes extended. While the first two periods exhibit a clear two-part structure, the third, fourth, and fifth periods are more complex. During the third period, the fore-phrase material is fragmented into three discrete parts, with the composite duration of all three parts similar to the duration of the original, first-period fore-phrase. These fore-phrase fragments are interspersed and paired with variations of the after-phrase material to create a total of three phrases, each with two subphrases—*subphrases* here meaning component parts of an established phrase. (Here the after-phase's notated fingerings differ from the first two after-phrases, now

using scale passages instead of arpeggios.) The fourth and fifth periods continue this developmental trajectory. While there are suggestions of the timbral and gestural elements of the fore- and after-phrases, the music becomes increasingly fragmented and introduces additional extended techniques (flutter-tongue and vocal *glissandi*). How to partition the material in periods four and five is less clear; both contain three shorter segments or gestures. My analysis divides the fourth period into two phrases, the first is comprised of two subphrases and the third segment is a complete phrase; these phrase boundaries are aligned with the timbral shifts from fore- to

**Example 5.3.** Crumb, *Vox Balaenae, Vocalise*, partitioning of periods 4 and 5

**Period 4 - 17.2 seconds**

phrase 1 - 12.3 seconds

phrase 2 - (after-phrase) - 4.9 seconds

subphrase 1 - (fore-phrase) - 7.4 seconds

subphrase 2 - (fore-phrase) - 4.9 seconds

**Period 5 - 17.7 seconds**

phrase 1 - 7.7 seconds

phrase 2 - 10 seconds - (fore-phrase)

subphrase 1 - (fore-phrase) - 2.2 seconds

subphrase 2 - (after-phrase) - 4.9 seconds

after-phrase. The fifth period is partitioned in the same way as the fourth, but its first phrase contains gestures of both fore- and after-phrase material, while the second phrase is based on the fore-phrase (see Example 5.3) The sixth and final period of this section returns to the fore-phrase *sing-flute* material, now as a fragmented restatement. In the sixth period, the original fore-phrase is split into three subphrases separated by fermatas, each one diminishing in volume and

tempo—marked in the score *poco più lento* (see Example 5.2 in Appendix A). (The use of *period* here may be a misnomer, as this sixth statement only contains fore-phrase material and lacks the balance and direction that we usually associate with a period. Nonetheless, the division of the fore-phrase material within this “period” does suggest a two-part structure, with the first two subphrases grouped as one phrase, and the last subphrase acting as a truncated closing.)

The progression across these six periods gives the *Vocalise* a developmental character—each subsequent period transforming, expanding or fragmenting the material introduced in the first period. The opening period acts as an exposition or presentation, introducing the prototype fore-phrase and after-phrase material; the second, third, fourth, and fifth periods develop this material, each in their own way, and the sixth period presents a simplified restatement of the opening fore-phrase, now fragmented.

### **Periodicity and Hypermeter**

Along with their increasingly fragmented internal structure, the *Vocalise*'s six periods are inconsistent in their duration (see Table 5.1), ranging from 8 to 31 seconds.<sup>53</sup> This variation creates irregular intervals between the beginnings of the periods. Even with this inconsistent spacing, we are able to understand the hypermetric structure of the *Vocalise* through the *periodicity* created by timbral variation alone. The alternation between the richer timbre and more distinct melodic gestures of the *sing-flute* sections (fore-phrases), and the less-stable timbre and held notes of the *through-the-flute* sections (after-phrases), creates a strong-weak juxtaposition between the component phrases of the first two periods. This timbral contrast, which helps to define the identity of the phrase components, is maintained in the third, fourth, and fifth periods, with alternations at shorter intervals, due to the fragmented internal structure of

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<sup>53</sup> According to score notations. Individual performance timings vary.

Table 5.1 - Crumb, *Vox Balaenae*, *Vocalise* – Period Timings

Period	Phrase 1	Phrase 2	Phrase 3	Total Period Timing
1	14.4	7.0		21.4
2	14.4	16.1		30.5
3	9.9	11.4	7.0	28.3
4	7.4	4.9	4.9	17.2
5	2.8	4.9	10.0	17.7
6	5.3	3.1		8.4

**Timings in Seconds**

these periods. Period three is comprised of three phrases, and each phrase contains subphrases of both fore- and after-phrase material, while in periods four and five, phrase divisions again align with fore- and after-phrase partitions. Although the spacing between the beginnings of periods is relatively inconsistent, this strong-weak alternation contributes greatly to the development of hypermetric structure. (The role of equal spacing in the perception of meter is discussed in chapter 2. Our expanded definition of meter suggests that in the absence of equal spacing, other factors, such as regular recurrence (periodicity) of material and the alternation between strong and weak elements, can play a prominent role in projecting meter.)

The contrast between timbres—analogueous to changes in instrumentation—marks the beginnings of the fore-phrases. We perceive the stronger, *sing-flute* timbral character of the fore-phrase that begins each period as an initiation point. In this case, predictable timbral variation facilitates a phrase structure that can alone establish hypermeter. Even though the internal structure of each period changes, the fact that they each begin with a repeating strong timbre allows the listener to perceive hypermetric structure.

### **Period Spacing and Melodic Structure**

Another factor that supports the structural accents of the fore-phrases in the *Vocalise* is the consistency of the fore-phrases' initial melodic gestures. All six begin with the pitch D4, either as a sustained note or a grace note, and four of the six begin with a variation of the same melodic gesture—D4 to E4 (the other two begin with D4 to G#4). Additionally, with the exception of period four, each fore-phrase has roughly the same melodic contour, rhythmic character, and uses the same pitch collection for each iteration, with only slight variations or fragmentation (see Example 5.4). This opening melodic gesture, along with the consistent melodic and rhythmic shape of the fore-phrase, helps the listener identify and recognize each fore-phrase as the beginning of a new period, and, in turn, a hypermetric downbeat (see Example 5.2 in Appendix A). Finally, Crumb's notation seems to support this interpretation of the period structure, as the notated breath marks are aligned with the current analysis.

### **Period Relationships and Hypermetric Hierarchy**

Because of this period structure, I argue that we can perceive a hypermetric structure across the *Vocalise*. Just as motives can create meter on a smaller scale, phrases and periods can establish hypermetric organization on a larger scale. Analyzing this structure necessitates exploring the hypermetric hierarchy of the opening passage; examining the connections and relationships between periods can help illuminate its organization. The first, second, and third period are undeniably related, because of the similarity of their component phrases, even though the third period differs structurally. The first and second periods are identical in shape and timing except for the extension of the second period's after-phrase. The third period retains the same phrase components as the first and second periods, but its fore-phrase material is fragmented and split into three segments, which are interspersed with fragments of the after-phrase. As

**Example 5.4.** Crumb, *Vox Balaenae, Vocalise*, period beginnings

The image displays six musical periods from the piece 'Vocalise' by John Crumb. Each period is represented by a system of two staves: the upper staff for Electric Flute and the lower staff for Sing.   
**Period 1:** Labeled 'Vocalise (..for the beginning of time)' and 'Wildly fantastic; grotesque (♩=64)'. It features a complex, rhythmic melody in the flute and a more melodic line in the voice.   
**Period 2:** Continues the complex, rhythmic texture with similar melodic patterns.   
**Period 3:** Shows a change in texture, with the flute playing arpeggiated figures and the voice line becoming more prominent.   
**Period 4:** A shorter period featuring a triplet in the flute and a more sustained vocal line.   
**Period 5:** Characterized by a 'finito' marking and features a series of arpeggiated chords in the flute, with the voice line providing a steady accompaniment.   
**Period 6:** The final period, marked '(poco più lento)', which returns to a more fragmented and slower melodic style, reminiscent of the opening.

mentioned above, the third period after-phases differ from the first and second period after-phrases (see period 3, phrase 1, subphrase 2; and phrase 2, subphrase 2), now using scale passages instead of arpeggios. The resulting change in sound is minimal, but the higher vocal pitch of the third period's first two after-phrase fragments (Bb3) gives these subphrases greater forward momentum. Periods four and five are the most developmental in character, still alternating between the *sing-flute* and *through-the-flute* characters, but the melodic gestures of these fore- and after-phrases vary from that of the first three periods. The sixth and final period returns to fragmented segments of the opening fore-phrase material, repeated and diminishing in

volume, which, through its repetition of the opening, first period material, acts as a closing to the entire opening *Vocalise*.

### **Hypermetric Terms**

Now that we have broken down the elements of the individual phrases and periods, how do we approach conducting a hypermetric analysis of these elements? Because there are no measures, we must use phrases or subphrases as the units of measure. Additionally, the alternation between strong and weak component phrases can guide the placement of hypermetrically strong and weak beats. In the absence of notated measures, we need to develop new terminology in order to label hypermetric levels. In the previous case studies, we have discussed hypermeter at the *measure* level or *double-measure* level. Here we can introduce new terms: hypermeter at the *phrase, period, and double-period* levels. Following our discussion of multiple hypermetric levels in chapter 2, we can refer here to phrase-level hypermeter as level one, period-level hypermeter as level two, and double-period level hypermeter as level three.

### **Partitioning**

Thus far, we have discussed two elements that can be used to parse the structure of this section—timbral content and periodicity. (While related to duration, I argue that periodicity also encompasses larger issues of strong-weak alternation and repetition of gestures.) In this piece, timbre and periodicity are generally aligned, while duration and periodicity are often not. For example, it is possible to use timbre to partition the first period into a two-part structure, but the duration of the fore- and after-phrases doesn't support this division, as the fore-phrase is significantly longer than the after-phrase. Contrarily, the third period could be divided in two parts by duration, but a timbral partitioning wouldn't support this, as the timbral shift happens at shorter intervals than in the first period. Dividing the second period into two parts is supported by both timbre and duration, as this period consists of two phrases of equal length. This disparity

between the periodicity of timbral shifts and durational periodicity prompts us to privilege the periodicity of timbral changes in this case.

### **Hypermeter at the Period Level**

Returning to our discussion of factors associated with the perception of meter (chapters 1 and 2), three elements are key to begin our analysis: 1) An *alignment of pulses*—while this is not readily available in music without notated measures or a regular, metronomic pulse, we still find aspects of this in Crumb’s music. Following our above discussion of timbre vs. duration in determining phrase boundaries, we can think of the alignment between these two elements as analogous to the alignment of multiple layers of pulses. When timbre and duration are aligned at phrase boundaries, this can reinforce the sensation of a structural accent—a downbeat—just as the alignment of quarter notes and eighth notes can in a different musical context. 2) An alternation between *strong* and *weak* elements (this could be a binary alternation, i.e., strong-weak, strong-weak, or another configuration, i.e., strong-weak-weak, strong-weak-weak). And 3) *Regularly recurring points or events*—features that we can understand as *hyperbeats*, such as the beginnings of phrases. As discussed above, I emphasize the importance of *regularity* over *equal spacing* in the perception of meter. In many cases, the recurrence of events is more important to the listener’s perception of structure than equal spacing between events.

### **Hypermetric Analysis**

Because of their clear alternation between fore- and after-phrases, the first two periods appear to divide easily into duple hypermeasures at the period level—the fore-phrase acting as the hypermetric downbeat and the after-phrase as the hypermetric upbeat. In this case, each period is one complete *hypermeasure* and the individual phrases act as *hyperbeats*—establishing duple hypermeter at the *period* level (level two). One complicating factor of this analysis of the

first period is the unequal durations of its two phrases (15 seconds and 7 seconds, respectively). This structure would therefore be an example of irregular hypermeter at the *hyperbeat* level, meaning that the hyperbeats that make up a hypermeasure are unequal in length<sup>54</sup> (see Example 5.5). The second period also fits the duple hypermeter model, and its phrase lengths are more uniform than in the first period (15 and 16 seconds, respectively).

**Example 5.5.** Crumb, *Vox Balaenae, Vocalise*, periods 1 & 2, duple hypermeter at period level

**Period 1**

Duple hypermeter: 1  
at period level

Hyperbeat: 1

phrase 1 (fore-phrase) - 14.4 seconds

2

phrase 2 (after-phrase) - 7 seconds

Vocalise („for the beginning of time)  
Wildly fantastic grotesque (♩ = 64)

(a tempo sempre, ♩ = 7)

play

Electric Flute

sing

**Period 2**

Duple hypermeter: 2

Hyperbeat: 1

phrase 1 (fore-phrase) - 14.4 seconds

2

phrase 2 (after-phrase) - 16.12 seconds

(a tempo sempre)

In the third period, however, this approach of analyzing hypermeter at the period level begins to break down, as the straightforward, two-part structure of the first two periods is missing. While the first two periods present the fore-phrase and after-phrase consecutively, the third period intermixes the two, which results in three shorter phrases. The fore-phrase in the third period is divided into three parts, interspersed with after-phrase material, making a phrase-level duple hypermetric analysis impossible. If we continue to use timbre as a means to determine phrase, we can break the third period into six component parts—three *sing-flute* segments and three *through-the-flute* segments—presented in alternation. This partitioning of the

<sup>54</sup> See discussion of irregular hypermeter types in chapter 2.

third period into three phrases, each made up of two subphrases, suggests three groups of two—or three duple hypermeasures at the *phrase* level (level one)—shorter in duration than the previous hypermeasures.

Interestingly, this smaller segmentation seems to address the problem of unequal durations encountered in the period-level hypermetric analysis of the first period. Whereas the phrase lengths in the first period are significantly uneven, the third period's subphrase lengths are relatively equal—between 3 and 7 seconds each. (Phrase 2, subphrase 1 is an exception with a duration of 1.3 seconds.) With this information, let's look again at the fore-phrase presented in the first period (see Example 5.6). If we do not define it strictly through timbre, and instead use a combination of *timbral* periodicity and *durational* periodicity as a guide, we can divide this fore-phrase into smaller parts—into at least two, if not three, *subphrases*.

**Example 5.6.** Crumb, *Vox Balaenae, Vöcalise*, period 1 subphrases

The image shows a musical score for three parts: play, Electric Flute, and sing. The score is divided into 'Period 1' and 'after-phrase'. The 'fore-phrase' is marked as 14.4 seconds long. It is further divided into three subphrases: subphrase 1 (5 seconds), subphrase 2 (4.7 seconds), and subphrase 3 (4.7 seconds). The 'after-phrase' is marked as 7 seconds long. The score includes various musical notations such as rests, notes, and dynamic markings. A tempo marking '(a tempo sempre, ♩=♩)' is present. The play part has a '5' above it, and the sing part has a '3' above it. The Electric Flute part has a circled 'sing-flute' marking.

We can consider the opening held note first period's fore-phrase as one segment, and divide the fore-phrase's beamed segment that follows into two segments, splitting them at the thirty-second rest after the fifth dotted-sixteenth-note group. Each one of these subphrases lasts roughly five seconds, followed by the after-phrase, which lasts approximately seven seconds. Dividing the fore-phrase this way results in much more equal phrase segments, which—along with the timbral periodicity of the phrases—strengthens the perception of hypermeter in this

passage. As it is almost identical in duration to the first period, the second period's fore-phrase can be segmented in a similar fashion. The fore-phrase can be split into three five-second segments, now followed by two after-phrase segments, lasting approximately seven and nine seconds, respectively. This division of the period structure into subphrases allows for additional analytical possibilities for these first two periods. While our first analysis considered complete phrases, our reconsideration and further division of the first two periods presents us with shorter segments that are more equal in duration while still retaining timbral periodicity. The more equal duration of these subphrases suggests that we also consider the after-phrases as shorter *subphrase* segments, rather than complete phrases. The first period could therefore be analyzed hypermetrically at the phrase level, as two duple phrase-level hypermeasures (two duple level-one hypermeasures) (see Example 5.7). Within the frame of this reconsideration, the five-second segment emerges as a *hyperbeat*, which can inform our analysis of the following periods.

**Example 5.7.** Crumb, *Vox Balaenae, Vocalise*, period 1, hypermeter at the phrase level

The image shows a musical score for 'Period 1' of Crumb's *Vox Balaenae, Vocalise*. It features three staves: 'play' (piano), 'Electric Flute', and 'sing'. The score is annotated with hypermetric analysis. A 'Duple hypermeter' is indicated above the first two measures. The score is divided into a 'fore-phrase' (14.4 seconds) and an 'after-phrase' (7 seconds). The fore-phrase is further divided into three subphrases: subphrase 1 (5 seconds), subphrase 2 (4.7 seconds), and subphrase 3 (4.7 seconds). Hyperbeats are numbered 1 through 4. Performance instructions include '(a tempo sempre, ♩=♩)' and '(tr)'. The score includes various musical notations such as notes, rests, and dynamic markings.

Period two is structurally similar to period one, with one additional after-phrase, and can likewise be partitioned into five subphrase segments. The first four subphrases—almost identical to those in the first period—can likewise be analyzed as two duple phrase-level hypermeasures or one quadruple phrase-level hypermeasure, but the inclusion of the fifth subphrase requires a

modification to this analysis. The most likely adjustment is to analyze this period as one duple phrase-level hypermeasure and one triple phrase-level hypermeasure, but in what order? If we use timbre here to inform our analysis, the result will be to group the first three subphrases as a triple hypermeasure, and the last two as a duple hypermeasure (see Example 5.8).

**Example 5.8.** Crumb, *Vox Balaenae, Vocalise*, period 2, hypermeter at phrase level

At first glance, the third period seems to group easily into three duple phrase-level (level-one) hypermeasures, each one beginning with a fore-phrase fragment. However, the fragment that begins the second phrase happens so quickly it feels as if it should be grouped together with the next subphrase as one hyperbeat (see example 5.9). Considering this, the third period can also be analyzed as one duple phrase-level hypermeasure (subphrase 1 as a hypermetric downbeat; subphrase 2 as an upbeat), and one triple phrase-level hypermeasure (the now-combined subphrases of phrase 2 as a hypermetric downbeat, and the subphrases of phrase 3 as hyperbeats two and three). It is possible to defend the first analysis of this period as three duple hypermeasures—grouped according to timbral alternation—but in this case the duration of the subphrases supports analyzing the third period as one duple hypermeasure and one triple hypermeasure, both at the phrase level.

The clear three-part structure of the last three periods suggests that each aligns with a triple hypermeter. Periods four, five, and six all begin with a fore-phrase, *sing-flute* gesture,

marking the beginning of each as a hypermetric downbeat. There is significant variation in the duration of individual subphrases that make up the hyperbeats of these last three periods

**Example 5.9.** Crumb, *Vox Balaenae, Vocalise*, period 3, two hypermetric possibilities at the phrase level

**Period 3 - 28.3 seconds**

Hypermeter 1: [1] | 1

Hyperbeats: 1 2

Hypermeter 2: [1] | 1 2

Hyperbeats: 1 2

subphrase 1 - (fore-phrase) - 4 seconds

subphrase 2 - (after-phrase) - 5.8 seconds

phrase 1 - 9.9 seconds

play

Electric Flute

sing

Hypermeter 1: [2] | 3

Hyperbeats: 1 2 1 2

(Triple Hypermeasure)

Hypermeter 2: [2] | 1 2 3

Hyperbeats: 1 2 3

subphrase 1 - (fore-phrase) - 1.3 seconds

subphrase 2 - (after-phrase) - 5.8 seconds

subphrase 1 - (fore-phrase) - 3.1 seconds

subphrase 2 - (after-phrase) - 6.9 seconds

phrase 2 - 7.1 seconds

phrase 3 - 10 seconds

(between two and ten seconds); however, because these divisions are supported by timbral shifts, the durational difference between segments does not disrupt the listener's perception of a hypermetric structure, further demonstrating the importance of periodicity created by timbral alternation. Periods four and five alternate timbral character with each subphrase; while period six contains only fore-phrase material, and thus does not exhibit timbral alternation, the relatively equal duration of its three fore-phrase fragments projects durational periodicity, which also supports the perception of hypermeter. In these last three periods, both timbral alteration and duration create periodicity. Example 5.10 in Appendix A shows the overlap of phrase and

subphrase duration and the timbral alternation in each period, along with the hypermetric analysis. Example 5.11 in Appendix A shows a more-detailed hypermetric analysis of this section.

We have considered hypermeter at the period (level two) and phrase (level one) level, but what about hypermeter at the double-period level (level three)? The above analyses suggest a few possible ways of grouping these periods. There are two pairs of periods that seem related, based on their content—periods one and two, and four and five. Period three further develops the material presented in periods one and two, and period six acts as a closing gesture. One possible grouping of this section is to consider the periods as two groups of three, while another approach could create three groups—periods one, two, and three grouped together, periods four and five grouped together, and six as an outlier. If we accept the former analysis—six periods divided into two groups of three—we maintain the possibility of triple hypermeter at the *double-period* level, partitioning the entire *Vocalise* into two triple double-period hypermeasures, or a level-three triple hypermeter (see Example 5.12 in Appendix A). An alternative but related large-scale reading is to consider a compound hypermetric construction, analogous to 6/4, with the strongest hypermetric downbeat falling on the first period, and the hypermetric upbeat falling on the fourth period. While this type of large structure is undoubtedly difficult to perceive in real time, it seems consistent with the organization of the *Vocalise* as a whole.

## Chapter 6: Conclusions and Further Applications

This writing began as a consideration of how the listener experiences music, specifically aspects of rhythm and meter. Lerdahl and Jackendoff discuss meter as a mental construct, as building a metric framework from the events a listener hears on the musical surface. Once established, this metric framework helps the listener process and orient subsequent musical events and perceive rhythmically driven phenomena like syncopation. The study of hypermeter—the extension of metric organization beyond the measure level—has primarily been applied to music of the Common Practice period, as in seminal works by Rothstein, Schachter, and Lerdahl and Jackendoff.<sup>55</sup> However, there has been far less consideration paid to hypermeter in twentieth-century music. The nature of meter is, by conventional definitions, tied to regularity, which is not a prevalent characteristic in many subsets of twentieth-century music. Motivated in part by this imbalance between the hypermetric analysis of Common Practice-era and twentieth-century music, I chose to examine hypermeter in selections from twentieth-century repertoire.

In light of the twentieth century's metric irregularity, one of my initial themes of inquiry was to explore how listeners orient themselves within metrically disorienting repertoire. I began by reviewing definitions of key terms and concepts relevant for parsing hypermetric structure, such as meter, phrase, and accent, considering modifications to some of these, and, most importantly, broadening the range of factors that we can consider to create meter. In the Common Practice era, regularly recurring, *equally* spaced beats were a precondition for meter, but because much twentieth-century music eschews equal spacing and resists expectations of

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<sup>55</sup> See Lerdahl and Jackendoff, *A Generative Theory of Tonal Music* (1983), Schachter, "Rhythm and Linear Analysis: Aspects of Meter" (1987), and Rothstein, *Phrase Rhythm in Tonal Music* (1989).

regularity and predictability—I endeavored to expand this definition. I argue that music featuring a regularly recurring pattern of *unequally* spaced beats can also project meter, and that the listener can identify a metric framework based on those repeating elements alone.<sup>56</sup> If we can build a metric framework from unequally or irregularly spaced beats at the measure level, we should be able to broaden this modification to the hypermeasure level. To support this development, I defined different types of hypermetric irregularity, such as irregular hypermeter at the *hyperbeat level*—unequal spacing between beats, and irregular hypermeter at the *hypermeasure level*—an unequal number of hyperbeats in consecutive hypermeasures.

I argue in this study that underlying metric structures do exist in music that is metrically complex and irregular. My initial hypothesis was that hypermeter in metrically disorienting music was related to the alignment between phrase and metric structure, and that goal points of phrases could serve as temporal markers in the absence of predictable metric regularity. Additional factors I considered, either at the outset or as they arose, included the alignment of multiple metric layers in generating structural or hypermetric downbeats, and the role that periodicity can play—especially when created by means other than duration, such as timbral alternation—in creating a hypermetric framework. After applying these analytical frames and approaches to three case studies, I conclude this study with confidence that my initial hypothesis—that hypermeter is projected by phrase structure and goal points of phrases—is not only correct, but can be helpful in explicating the complex metric designs of many twentieth-century repertoires. Additionally, both periodicity and the alignment of multiple metric layers proved to be effective in illuminating hypermetric structure in our case study analyses.

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<sup>56</sup> It is important to note that there are undoubtedly repertoires in the Common Practice era and well before that contain unequally spaced beats.

This type of analysis is valuable because these structures can highlight organization not readily apparent at the measure level, and this organization, in turn, can help the listener track large-scale development across a section of music. In many repertoires, context plays a key role in perceiving hypermeter; perceptual clues, such as timbral shifts and the alignment of stratified metric layers, can help to establish and track this perception. The more metrically irregular a passage, the more listeners must rely on these contextual factors.

In selecting the case study pieces, I attempted to cover a range of repertoire that approached meter in different ways. Due to its neoclassical orientation, Stravinsky's *Symphony in C* has the most in common with Common Practice-era design. Because of these influences, perhaps, we found in its first movement clear hypermetric organization, as well as hypermetric similarities to two Classical masterworks—Beethoven's Symphony no. 5 and Mozart's Symphony no. 40. The first movement's hypermetric orientation shifts effortlessly from phrase to phrase and contributes to the formal design of the movement by generating contrast between metric stability and instability. The opening movement of John Adams's *Road Movies* features a steady quarter-note beat throughout, but the phrase lengths of the violin line—the primary driver of meter in this movement—constantly expand and contract; each change in phrase length produces a metric shift. In contrast to *Symphony in C*'s pinpoint hypermetric shifts, the interactions between the piano and violin in *Road Movies* create composite metric structures that, though fleeting, provide moments of hypermetric emphasis which mark points of alignment in these seemingly autonomous metric layers. In my consideration of both Stravinsky and Adams, I invoke Andrew Imbrie's notion of *radical* versus *conservative* listeners to discuss how the listener reacts to hypermetric changes. In our discussion of Crumb's *Vox Balaenae*, I ask the reader to further expand their concept of meter, and attempt to understand hypermeter as

projected by the physicality of gesture and the alternation of timbre alone, creating a phrase-based structure in the absence of a metric grid. Despite the absence of notated meter, the opening *Vocalise* section projects clear hypermetric structure solely through its phrase structure, which creates periodicity through timbre and gesture alone, and enables the listener to perceive hypermetrically strong beats that *feel* regular and predictable, even when its unequal phrase lengths seem to belie this perception.

In pursuing this study, I found that factors key to projecting meter and hypermeter in Common Practice-era music are also relevant to contemporary music. Many of the concepts discussed by Rothstein and others in reference to composers like Haydn, Mozart, and Beethoven, such as hypermetric shifts and metrical reinterpretation, were applicable to our case studies. Examples of both phenomena are found in *Symphony in C*, and we see hypermetric shifts as a formal process in *Road Movies*.

As Schachter and others write, meter is projected by the alignment of layers of pulses. Across the three case studies, we see that this alignment of layers can apply to a range of parameters. In *Symphony in C*, the convergence of different instrumental choirs is a frequent organizing force in the projection of meter. As the winds and strings move in and out of alignment, the first movement's opening shifts across a spectrum from hypermetric clarity to ambiguity. It is not until the *tutti* arrival at m. 15 firmly announces that *this* is where the beat is, that the hypermeter finally comes into focus. In Adams, we hear *hemiola*-like metric layers, not dissimilar to the interlocking parts of Afro-Cuban rhythms. *Road Movies* begins on firm metric footing because of the alignment of these layers, encouraging the listener to track the violin line against the static piano *ostinato*. Once the violin line begins to veer off course, we must break our connection with the initial alignment and follow the initiation points of the melodic gestures

in order to track the hypermeter. *Vox Balaenae* demonstrates that hypermetric emphasis can be created by the alignment of layers that are not strictly rhythmic; the alignment of gesture and timbre can support metric and hypermetric emphasis in the same way that the alignment of half notes and quarter notes can. It is this alignment of parameters, outside the traditional domain of meter, that project periodicity in the *Vocalise*, establishing a strong-weak alternation that acts as a proxy for meter.

If periodicity can indeed be created by parameters other than duration, then this is potentially one of the most impactful outcomes of this study. A more expansive and flexible approach to periodicity could be applied to a broad range of repertoire, particularly pieces that intentionally eschew conventional or predictable meter. This, along with the realization that meter and hypermeter can be projected by the alignment of layers other than purely rhythmic events, are meaningful expansions to our concepts of meter and hypermeter.

In closing, it is my hope that the findings of this research will generate further discussion and encourage further analysis. This has been only a small step in the application of an existing analytical methodology to a wider repertoire, and I look forward to seeing the ways in which others will continue to adapt and build on this methodology. If our perception of meter can expand to encompass gesture, periodicity, and parametric alignment as supplements—or even substitutions—for more-conventional elements, we can considerably extend the range of repertoire for which large-scale metric analysis is applicable. Rothstein and others have used hypermetric analysis, coupled with analysis of pitch structure, to shed new light on the large-scale design of numerous Common Practice masterworks. I believe that further efforts to pursue the hypermetric analysis of contemporary music, on its own or in combination with other

methods, will contribute to a deeper understanding of the formal design, contrasts, and commonalities within a broad range of twentieth-century music.

# Appendix A

Example 5.2. Crumb, *ix. Boléense, focalis*, period, phrase, and subphrase structure with timings

**Period 1 - 21.4 seconds**

phrase 1 (fore-phrase) - 14.4 seconds  
 phrase 2 (after-phrase) - 7 seconds

**Period 2 - 30.3 seconds**

phrase 1 (fore-phrase) - 14.4 seconds  
 phrase 2 (after-phrase) - 4 seconds

**Period 3 - 28.3 seconds**

phrase 1 - 9.9 seconds  
 subphrase 1 - (fore-phrase) - 4 seconds

**Period 4 - 17.2 seconds**

subphrase 1 - (fore-phrase) - 5.8 seconds  
 subphrase 2 - (after-phrase) - 7.1 seconds

**Period 5 - 17.2 seconds**

phrase 1 - 12.3 sec  
 subphrase 1 - (fore-phrase) - 4.9 seconds  
 subphrase 2 - (after-phrase) - 2.2 seconds

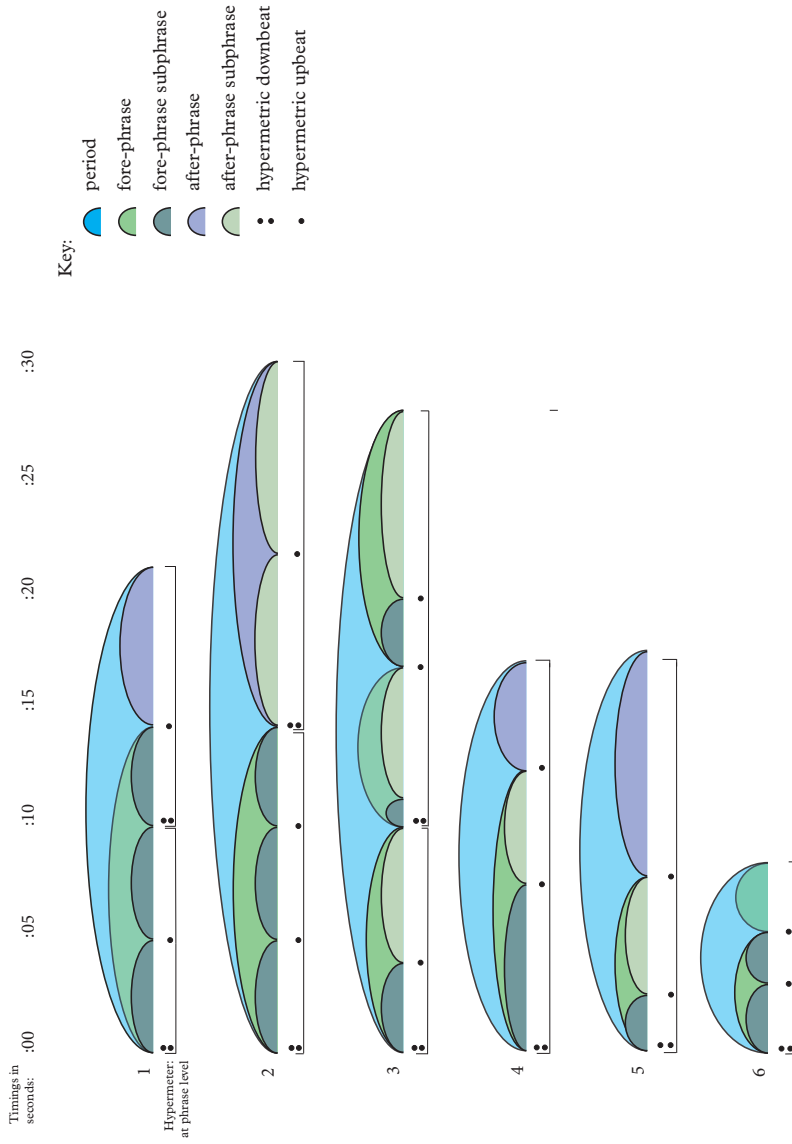
**Period 6 - 8.1 seconds**

phrase 1 - 5.3 seconds  
 subphrase 1 - (fore-phrase) - 3.1 seconds

**KEY:**

- ☐ = long fermata
- ◡ = normal fermata
- = 'breath' or pause
- ~ = very short 'breath' or pause
- + = indicates through-the-flute technique

**Example 5.10.** George Crumb, *Vox Balaeanae, Vocalise*  
 Phrase duration and timbral alternation with hypermeter at the phrase level



**Example 5.11.** Crumb, *ix. Reducens, Vocalis*, complete hypermetric analysis at the phrase level

Hypermeter: 11  
 at Phrase Level  
 Hypermetric

Period 1: Double Phrase-Level Hypermeasures (or One Period-Level Hypermeasure)

Period 2: Double and Triple Phrase-Level Hypermeasures

Period 3: Double and Triple Phrase-Level Hypermeasures

Period 4: Triple Phrase-Level Hypermeasures

Period 5: Triple Phrase-Level Hypermeasures

Period 6: Triple Phrase-Level Hypermeasures

KEY:

- = long fermata
- = normal fermata
- = "breath" or pause
- = very short "breath" or pause
- + = indicates *through-the-flat* technique

The score is presented in a multi-staff format, with parts for piano (piano), electric blue (electric blue), and singing (sing). The analysis includes various annotations such as fermatas, breaths, and through-the-flat techniques. The score is divided into six periods, each with hypermeasures and phrase-level hypermeasures. The analysis includes various annotations such as fermatas, breaths, and through-the-flat techniques.

**Example 5.12. Crumb, *for Balloons, Vocalists, Vocalists*, double-period-level hypermetric analysis**

Compound Hypermeter: 1  
 Hyperbeat: 1  
 Triple Hypermeter: 1  
 Hyperbeat: 1  
 Compound Hypermeter: 2  
 Hyperbeat: 2  
 Triple Hypermeter: 2  
 Hyperbeat: 2

Compound Hypermeter: 3  
 Hyperbeat: 3  
 Triple Hypermeter: 3  
 Hyperbeat: 3

Compound Hypermeter: 4 (first hypermeasure continues)  
 Hyperbeat: 4 (beginning of second hypermeasure)  
 Triple Hypermeter: 4  
 Hyperbeat: 4

Compound Hypermeter: 5  
 Hyperbeat: 5  
 Triple Hypermeter: 5  
 Hyperbeat: 5

Compound Hypermeter: 6  
 Hyperbeat: 6  
 Triple Hypermeter: 6  
 Hyperbeat: 6

KEY:  
 — = long femina  
 ○ = normal femina  
 • = "breath" or pause  
 / = very short "breath" or pause  
 + = indicates through-the-flute technique

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