TOWARD A METHOD FOR PERFORMANCE ANALYSIS OF TWENTIETH-CENTURY MUSIC

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ABSTRACT

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This document discusses the benefits of performance analysis in general and the need for a method for performance analysis of twentieth-century music. To help satisfy this need, it presents analytical techniques that aid performers in segmenting post-tonal music on multiple hierarchical levels as well as determining the intensity shapes (the increases and decreases of intensity) of the segments at all levels.

The document begins in chapter 1 with a discussion of reasons and goals for performance analysis, which include aiding a performer in the creation of an interpretation that is logical, coherent, and personal. Performance analysis can also aid memorization as well as provide the performer with a greater ability to speak clearly about music.

The second chapter is a discussion of the techniques used in selected performance analyses of twentieth-century music. The articles range from highly performance-oriented to highly theory-oriented (and everything in between). Both the merits and the shortcomings of the articles are discussed.

The third chapter presents the method, which includes techniques and guidelines for segmentation on a number of hierarchical levels (phrases, phrase groups, subsections, sections), determination of intensity shapes within each of those segments, and graphic representation of the results of these analyses. The segmentation technique relies heavily on the grouping preference rules established by Fred Lerdahl and Ray Jackendoff in their book, *A Generative Theory of Tonal Music*. The determination of intensity is loosely based on the concepts of progression and regression put forth by Wallace Berry in his book *Structural Functions in Music*. 
For the purposes of illustration, in chapter 4 the method is applied to Charles Wuorinen’s Divertimento for alto saxophone and piano. (An appendix including the analytical results in graphic form is located at the end of the document.) The chapter focuses on points in the composition that illustrate aspects of the method put forth in the previous chapter. Following chapter 4 is chapter 5, which presents a conclusion and suggestions for further research.
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CHAPTER 1

Introduction

For many performers, deciding how to interpret a piece can be a challenging task. If they are inexperienced, the task becomes even more daunting, as they do not have well-developed intuitions on which to depend. The challenges become even greater when dealing with twentieth-century music. Then, even seasoned performers may feel as though their intuition is less than adequate. A solution to this inadequacy would be a method for performance analysis of twentieth-century music that would help performers develop a greater understanding of the construction of a composition and, consequently, a richer network of information to guide them through performance decisions.

To date, there is a fair amount published that presents techniques for performance analysis of twentieth-century music but little that presents a method. None of the existing literature gives performers a clear direction on how to execute a comprehensive performance analysis; a method that provides such direction would be highly valuable. Chapter 3 presents the foundation of such a method, followed by an application of the method in chapter 4 and suggestions for further research in chapter 5. Chapter 1 discusses the benefits of performance analysis, and chapter 2 briefly reviews a number of performance analyses of twentieth-century compositions. As a whole, these five chapters should be beneficial to both performers and theorists who seek information regarding performance analysis of twentieth-century music as well as performance analysis in general.
Goals and Reasons for Performance Analysis

When an inexperienced performer is faced with the task of interpreting a composition, the options for deciding how to do so are limited: one could follow the instructions of a teacher, which is what many end up doing; a recording could be consulted and mimicked; or no decisions could be made at all, leaving the results to chance.

In the cases of the first two options, the results will likely be passable and possibly even quite good, but they will not be the performer’s own. Music is a creative art in which individuality and originality are valued to a significant extent. Therefore, it makes sense that one would want to contribute something of one’s own in the creation of an interpretation of a piece of music. If the performer is not going to personalize the performance in any way, a recording may as well be played. In the case of the third option, the results will likely be unmusical and illogical. An unsatisfying performance is nearly inevitable in this case.

An alternative to these three options is for the performer to do a performance analysis of the piece. Chances are much greater in this case that the outcome will be a unique and personal interpretation that is logical and coherent. The performer will make conscious decisions about the structure and character of the music and how that should affect the performance.

In his book, *Anxiety and Musical Performance: Playing the Piano from Memory*, Dale Reubart advocates that the performer should have an understanding of the composition as a whole.¹ This will help provide an understanding of one’s location within the composition at any time and how that relates to the piece on larger structural levels. Such awareness of a musical composition will likely greatly enhance one’s performance of the piece, as the construction of

1. 133.
the work and the interrelationship of its components will be better understood, increasing the likelihood that such interrelationships are conveyed in performance.

Another way in which performance analysis can be of use is when a performer wishes to justify his or her interpretation to another performer or a student. The performer has a reason for the decision instead of “I feel it this way, don’t you?” Performance analysis gives teachers and performers objective support for interpretive decisions. It can serve as a way of helping students or fellow performers further develop their own interpretive skills.

Performance analysis can also provide performers with a greater ability to communicate with others about an interpretation. The results of a performance analysis can often be much more easily communicated than the results of an intuitive approach to musical interpretation. For those wishing to explain their understanding of a piece of music (especially teachers), interpretation based on performance analysis is much more practical than interpretation based exclusively on intuition.

Furthermore, there is an increased level of specificity with which performers may speak about music. Instead of using the “arcane sign-gesture-and-grunt system” of conversation that Joseph Kerman describes, performers can speak much more clearly, efficiently, and effectively about the different aspects of a musical composition on which they are working. This is of benefit in rehearsals, lessons, and general discussions about music.

Performance analysis can also be an aid to one who wishes to memorize music more effectively. There are four aspects of memory that performers use when memorizing a piece of music: kinesthetic, aural, visual, and theoretical. A performer’s memorization of a piece is

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strongest when more than one of the four aspects are utilized to commit the work to memory. Using analysis to gain a greater theoretical understanding of a piece will aid the performer in memorizing it. For example, in Jacques Ibert’s Concertino da Camera, there is a passage in the second movement that can be thought of as a pattern in the octatonic scale: the rise of a fourth followed by a drop of a whole step (+5 half steps, -2 half steps), repeated several times (fig. 1a). This may be thought of in terms of intervals alone, as the pattern recurring within the octatonic collection, or as overlaid fully diminished seventh chords (fig. 1b). These alternate concepts of the passage provide the performer with efficient ways of remembering the passage. Rather than thinking of eleven different pitches, he or she can simply remember a pattern with a starting point. Instead of relying on kinesthetic, aural, or visual memory alone, the performer can use theoretical knowledge as well. (While the example illustrates theoretical knowledge as an aid to memorization of short passages, it can also be helpful when dealing with larger structures.)

(a)

(b)

Figure 1: Jacques Ibert’s Concertino da Camera with alternate pattern concepts. A passage from mm. 7 and 8 of the second movement can be thought of in multiple ways: as alternating ascending perfect fourths and descending whole steps (a) or as overlaid fully diminished seventh chords (b).
A theoretical understanding of a composition can help a performer divide the work into many smaller portions, which is especially beneficial for purposes of memorization. Memory works best when the information to be memorized can be related and combined into chunks, which help one organize and effectively process the material. Analyzing and labeling music gives the performer a more effective means of discovering relationships within the material, thus committing it to and solidifying it in memory much better.

Some advocates of performance analysis discourage the use of intuition. According to Wallace Berry, “the purely spontaneous, unknowing and unquestioned impulse is not enough to inspire convincing performance….Intuition is inadequate to solving dilemmas or providing justification that can be articulated.” In reality, intuition plays an important part in analysis itself and is often a valuable tool when making interpretive performance decisions. Intuition is an especially powerful resource when the performer has experience on which to base his intuitive decisions.

Ideally, the relationship between intuition and analysis is a symbiotic one. As Stanley Fletcher asserts, “Intuition needs the discipline of experience and knowledge and reason and is otherwise never entirely trustworthy in dealing with the complex and inter-related forces that make up a musical composition.” Kendall Taylor further articulates the relationship between intuition and analysis when he writes, “Any intuitive hunch must be open to justification by

4. Miller, “The Magical Number Seven, Plus or Minus Two: Some Limits on Our Capacity for Processing Information,” 93-97.
analysis and reasoning. We need, therefore, to have what may be called an ‘informed imagination’.”

John Rink refers to this when he writes of “informed intuition.” This is essentially a mutually dependent relationship between analysis and intuition. Rink says “analytical expertise should certainly be brought to bear on one’s performance…but…it is by no means the only way in which to penetrate the work.” While it can help an interpreter of music, analysis alone will not create a good musical performance. Analysis and intuition are both most effective when used in conjunction with each other.

The benefits of performance analysis used in conjunction with intuition are many. They can help the performer to develop a unique and personal interpretation that is logical and coherent, to justify a point of view, to speak more clearly about music, and even to memorize music more efficiently. Performers of all levels of experience can benefit from the partnership of performance analysis and intuition.

10. Ibid., 328.
CHAPTER 2: SURVEY OF SELECTED TWENTIETH-CENTURY PERFORMANCE-
ANALYSIS LITERATURE

The existing literature that deals with performance analysis falls into two categories: philosophical/theoretical writings (by such authors as John Rink, Jonathan Dunsby, and Wallace Berry, some of whose writings are mentioned in chapter 1) and technical/applicative writings. The theoretical writings discuss performance, analysis, and the relationship between the two; while the technical writings actually employ performance analysis but often without describing or fully explaining the methods/techniques used. Of the technical writings, typically only one in six deals with twentieth-century music.\(^1\) According to Richard Bass, even fewer essays address the performance and analysis of music composed after World War II.\(^2\) In a great deal of performance-analysis literature, there is an abundance of description and instructions for performers but little use of techniques that may be beneficial in the analysis of other compositions. Furthermore, in those cases where transferable techniques are utilized, they are not always used comprehensively, and how they are employed is not always explained.

Ideally, a good performance analysis is comprehensive in its approach to form, discussing aspects of the structure on a number of levels (phrases, phrase groups, subsections, and sections) and accounting for the piece in its entirety. A good approach to form should include some consideration of climax on multiple hierarchical levels. Such consideration helps to provide the performer with a more complete understanding of the character and shape of a piece. Many excellent analyses take into consideration structural function, which is the role an event plays at a specific place within a musical construction. For example, a certain musical figure may function as a concluding event: each time it recurs it acts as a closing device for the structure of which it

\(^1\) The extensive bibliography at the end of Cynthia Folio’s article, “Analysis and Performance of the Flute Sonatas of J.S. Bach: A Sample Lesson Plan,” exemplifies this ratio (154-59).
\(^2\) “George Crumb’s Apparition,” 58.
is a part. Considering structural function within a piece can help an analyst better understand how different parts of that piece are related to one another and to the piece as a whole. Analyses that feature transferable techniques are also of greater benefit to performer-analysts than those that do not. For a technique to be useful beyond its application in a particular analysis, it must focus on concepts that are relevant in other pieces as well. One should be able to generalize aspects of the technique and apply them to other works. A good performance analysis also includes implications for performance that are integrated with and supported by the analytical conclusions. Unfortunately, in many cases, so-called performance analyses make little or no connection between the analysis and suggestions for performance. Lastly, a good performance analysis should use techniques that are flexible enough to help the analyst decide what aspects of the piece are relevant for that particular analysis.

The existing twentieth-century performance-analysis literature may be placed on a continuum with theorist-aimed writings at one end of the scale and performer-aimed writings at the other. There are analyses at both ends of the spectrum, but the best can usually be found in the middle: their findings are well supported and have a basis in theory, yet they are not overly abstract or limited in their discussion of issues relevant to performers.

The analyses that are most obviously directed toward performers are often found in publications that specialize in a particular instrument. An example of such a publication is *Flute Talk*, a monthly, nonrefereed journal. The analyses in *Flute Talk* are largely descriptive and didactic in nature and often proceed in a very ad hoc fashion, providing solutions to problems that are unique to the piece at hand. They do not employ any method or set of techniques that one could extract and use on other pieces. Furthermore, the performance instructions given are often
unsupported by analytical findings or any other justification. The author simply writes, for instance, that a given figure is to be played in a certain fashion.

Performance analyses in nonrefereed journals are also often limited in the amount of analysis they actually do. In some cases, more historical information than analysis is presented. This practice can be very misleading. Young performers may come away from such an article thinking that analysis simply involves discovering facts about the creation of a piece and some things that the composer said about it. They will miss out on the valuable information they can gain from true analysis.

On the other end of the spectrum are analyses that are more theoretical in nature. Such writings may discover interesting connections within a piece of music and in some cases will make recommendations regarding how the performance of the piece should be influenced by these findings. However, this type of writing is sometimes a theoretical analysis with several comments on performance added as an afterthought.

Following are reviews of a number of performance-analysis writings that deal specifically with music of the twentieth century (see bibliography for full citations). The articles are presented in order from theorist-aimed to performer-aimed and are divided into three categories: those that are primarily analytical in nature with limited discussion of performance implications, those that feature a significant amount of integration of analysis and performance decisions, and those that feature very little true analysis, focusing instead on description.

The most clearly theorist-oriented article reviewed here is Christopher Wintle’s “Analysis and Performance: Webern’s Concerto Op. 24/II,” which is rich in theoretical information and analytical findings, giving suggestions for performance that are briefly and sporadically inserted into the analytical findings. The performance suggestions are well supported by and integrated
with the analytical conclusions. Wintle pays a significant amount of attention to questions of form and structure, describing large formal features as well as phrase construction. This is an excellent approach to analysis. To discern the form, Wintle uses tempo indications, pitch-class (pc) sets, and twelve-tone row usage. When present in music, these can all be helpful in determining structure, but a large portion of modern music does not feature tempo indicators the same way that Webern’s music does, nor is the majority of modern music dodecaphonic. While Wintle’s article deals with twelve-tone music very well, its techniques are only applicable to a portion of twentieth-century music.

Like Wintle’s, Richard Hermann’s article, “Some Uses of Analysis towards a Performance of Webern’s Op. 22 Movement I,” is largely analytical in nature with its extensive discussion of rows, contour, canons, and attack-point patterns. In addition to these areas of discussion, Hermann uses a number of techniques that are greatly beneficial for performer/analysts. One of these is observing which aspects of the composition will be most helpful in determining formal boundaries. In the case of the first movement of Webern’s op. 22, Hermann found dynamic changes, rests, and tempo indicators to be helpful.

Another technique that Hermann uses is discovering the structural function of musical events. Where an event occurs within a structure will help the analyst to understand its function (presentational, transitional, concluding, etc.). In some cases, a particular event will function in the same manner each time it appears, helping the performer/analyst to decide how the event and its surrounding material fit together. Recurrence of particular qualities of an event will likely indicate a return of the event’s function. This can be a powerful tool for the comprehension of post-tonal music. In traditional literature, structural functions are often consistent from one piece to the next, while in post-tonal music function is frequently established only within a piece.
Hermann’s performance suggestions are limited primarily to a brief paragraph listing a “sequence of tasks for the creation of a fine ensemble performance.” This list has little to do with the analysis that precedes it. The additional performance indications, which are well supported by analytical conclusions, are fairly sparse.

Another article rich in analytical details is Richard Bass’s “‘Approach Strong Deliveress!’ from George Crumb’s Apparition: A Case Study in Analysis and Performance of Post-Tonal Music.” It accounts for the form of the work quite comprehensively, both linearly and hierarchically, describing phrase and sectional divisions within the piece. These structural details are well supported by a significant amount of insightful analysis dealing primarily with pitch content. In addition to this, Bass discusses the melodic zeniths (climaxes) of various structures at a number of levels within the hierarchy of the piece.

The performance suggestions that Bass includes, although limited and somewhat unspecific, are integrated with and well supported by the analysis. Because the article’s focus is more on the use of this analysis for the purpose of teaching performance analysis, and not on the production of a guide for performance of the piece, the performance-relevant comments are posed as questions, rather than suggestions. Bass briefly discusses which climax points (or “points of structural articulation”) should be emphasized and how much emphasis the performer might wish to add beyond the composer’s indications at these points. He also mentions the aspects of the music the performer may wish to manipulate slightly (dynamics, timbre, voicing, tempo, and agogic accents) to contribute an “expressive edge” and gives some brief guidance as to how much one might manipulate the music without changing its character. However, Bass offers little guidance regarding specifically how one may transfer the results of the analysis to

4. 75-76.
performance. (In what manner should the performer manipulate the dynamics, timbre, voicing, tempo, and agogic accents?) This is perhaps to be expected as Bass’s primary audience is not the performer but the teacher.

Like Wintle’s, Hermann’s, and Bass’s articles, the next group, by Cynthia Folio, Judy Lochhead and George Fisher, and Jonathan Helton, are generally very theoretical in nature. However, this group of articles features more performance suggestions that are integrated with and supported by the analytical conclusions.

“Analysis and Performance: A Study in *Contrasts*” by Cynthia Folio makes excellent use of structural function. In *Contrasts* by Béla Bartók, Folio determines the role of numerous musical events, including pc-set recurrences, aggregate completions, and motivic recurrences. She then often uses this information to make assertions about how particular portions of the music should be performed. Her claims are effectively supported by this information. Folio also describes large-scale formal aspects and even goes so far as to provide a diagram of the form, all of which can be very helpful for the performer. Even more helpful are her indication of where the climax of the composition occurs and the results of analysis that contribute to this conclusion. Unfortunately, Folio does not give any indication of how she decided to assign large-scale formal boundaries to the piece. The reader is left to wonder whether the decision was based on thematic material, tonal centers, pitch collections, motives, or something else. Furthermore, Folio only segments and assigns climax points at the largest level. The performer has no indication of where smaller structures fit into the large form, much less where smaller climaxes occur or how to shape smaller sections. This is something of a disappointment after Folio’s excellent explanation of how climax is created on the largest scale of the piece.
While their article does not focus on form, “The Performer as Theorist: Preparing a Performance of Daria Semegen’s Three Pieces for Clarinet and Piano (1968)” by Judy Lochhead and George Fisher does discuss structural function a great deal, the discovery of which is an important technique within their process of performance analysis. They use it extensively to help decide the performer’s timing of various events within the music (primarily the lengths of the breaths), the grouping of ambiguous rhythmic figures, and how adjacent phrases relate to one another. The analysis that they provide is very good, offering exceptional insight into a number of pitch relationships. However, they use analysis primarily as a problem-solving tool. Instead of informing them about the entire work, performance analysis only addresses sparse details for Lochhead and Fisher. While this is certainly beneficial, analysts may not gain a complete understanding of a piece, if they fail to ask the right questions.

Another author who integrates performance indications with analytical findings is Jonathan Helton. While Folio and Lochhead and Fisher integrate performance indications and analytical findings more thoroughly in their writings than Helton does, his articles, “Edison Denisov’s Sonata for Saxophone and Piano: An Analysis for the Performer” and “Historical and Analytical Perspectives for the Performer on Luciano Berio’s Sequenza IXb,” are nonetheless insightful and informative, offering performers plenty of valuable information. Helton spends a great deal of time discussing pitch, rhythmic, and dynamic information and their implications for the structures of the compositions. Structural function is a concept that Helton uses to some degree, and he utilizes arch maps to graphically represent sectional divisions within the pieces. Helton’s discussion of large-scale formal divisions can be very helpful for the performer. As he says of Berio’s Sequenza IXb, “A work of this length (approximately 14 minutes) needs to be sectionalized in order to be understood. The listener and the performer both need to be able to
grasp smaller chunks of information to keep their attention.”

On upper hierarchical levels, Helton’s segmentation is thorough and well supported by his analytical findings. However, Helton employs a top-down approach and stops at the level of the subsection. Within each of these subsections are several phrases. Performers are given no indication of how they might determine where phrase and phrase-group boundaries occur. Even if analysts wanted to apply Helton’s large-scale techniques to smaller portions of the work in order to discover phrase boundaries, they would be unsuccessful; Helton states, “The sectionalization proposed herein is based upon changes in the various transformational processes used in the work. Each smaller section uses different methods of variation and change.” This indicates a limitation in Helton’s technique. In his article on the Denisov Sonata, Helton spends a great deal of time discussing dodecaphonic aspects of the composition and follows with a section labeled “considerations for the performer.” While they are helpful, these considerations are neither supported by nor integrated with the analysis presented before them. Rather, they focus on a number of selected points in the work with which the performer should be careful when making interpretive decisions.

The last group of articles, by Cynthia Folio, David Sills, Holly Clemans, and Thomas Siwe, are largely descriptive in nature and include suggestions for performance that are infrequently supported by analytical conclusions.

Cynthia Folio’s article, “A Performance Analysis of Berio’s Sequenza for Flute,” includes a brief bit of analysis and some indications for performance, but the two are not integrated to any great degree. Folio spends a significant amount of space discussing the notation used, in addition to instructing the performer on how a majority of the piece is to be performed.

6. Ibid.
Further, Folio discusses recurrent rows, motives, and themes but does not go so far as to indicate what function any of these may have, reducing the benefit of discovering them. One of the “hints for flutists” that Folio gives is to “decide where phrases begin and end; then group the smaller gestures and motives within the phrases.” This is an insightful suggestion, the results of which may help performers to better understand the construction of the phrases. Unfortunately, Folio does not explain or even suggest how the performer might determine where phrases begin and end, leaving performers with little more than they began.

Like Folio’s article on the *Sequenza*, David Sills’s “Benjamin Britten’s *Lachrymae*: An Analysis for Performers” focuses on the themes and motives present in the work. Sills pays particular attention to the ways in which these are altered and in what forms they reappear. And, like Folio, Sills does little to suggest what a performer might do with these themes and motives or what role they play in the piece. The closest thing to determining function that Sills does is to explain what key any tonal references suggest. Sills also provides a great deal of description in his article, discussing what happens from one variation to the next. In many cases, he indicates how and where phrases begin and end but does not mention what led him to those conclusions. This prevents the performer-analyst from transferring any analytical techniques from Sills’s article to the analysis of other compositions.

Contrary to what its title implies, Holly Clemans’s article, “Mario Davidovsky’s *Synchronisms No. 1*: An Analysis and Performance Guide,” is less analytically driven than other performance-analysis articles. For a majority of the article, Clemans simply describes the piece and gives instructions for learning how to play it. There is a significant focus on notation as well: how the performer can comprehend and subsequently realize unconventional musical
instructions. While this type of information is helpful for performers, it hardly falls into the category of performance analysis. Though she spends a relatively limited amount of space on structural functions, large-scale shape, and large-scale structure, Clemans does mention them. Unfortunately, she does not analyze the structure of the phrases, phrase groups, or subsections in *Synchronisms No. 1*.

Another article that places significant emphasis on description and instructions for the performer (which are infrequently supported by analytical findings) is Thomas Siwe’s “Edgard Varèse’s *Ionisation*: Analysis and Performance Problems.” A great deal of the article discusses instrumentation and gives suggestions regarding what specific instruments should be used. Contrasting this nonanalytical information, Siwe uses an excellent technique, when he writes, “Varèse appears to use the lion’s roar and occasionally the woodblocks and triangle for a transitional or cadential function.” What Siwe alludes to is the concept structural function, which can be helpful in determining the form of a modern composition.

While not comprehensive, this survey of twentieth-century performance-analysis literature provides an overview of a representative swath of articles. In some cases, the writings consist primarily of description and instructions for performance that are not founded in analytical examination of the works. In a number of instances, large-scale formal construction of compositions is discussed, but lower hierarchical levels of structure are not. Similarly, some of the articles deal with climaxes but not on all hierarchical levels. Those articles that are most beneficial for the performer-analyst typically feature analytical techniques and concepts that are transferable to other compositions. The most applicable and beneficial concept (and one of the most abundant) encountered in the literature is that of structural function, giving the analyst a

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8. 75.
powerful tool that contributes to an analytical determination of form. While a number of articles exhibit excellent transferable techniques for the analysis of twentieth-century music, only one (Bass’s) uses techniques that are comprehensive, taking into account the entire composition both linearly and hierarchically.
CHAPTER 3: THE METHOD

Introduction

When dealing with music of the baroque, classical, and romantic periods, many performers (especially those who are experienced) have a strong intuitive sense of how they should interpret a work. As Richard Hermann puts it, “Developing a sense of how tonal music ‘ought to go’ is made much easier for performers for at least two reasons. The first is a great familiarity with its sounds from birth. The second is that a great deal of agreement exists between [sic] composers of tonal music on basic materials (scales, specific harmonic structures etc.) and on organizing concepts (melody, cadences, form etc.).”\(^1\) Atonal music, on the other hand, does not typically exhibit agreement on these materials and organizing concepts, which has hampered the establishment of interpretive traditions.\(^2\) The absence of such traditions presents difficulties, even for experienced performers. These difficulties would be diminished, if there were a method for performance analysis of twentieth-century music.

One common problem in modern music is determining where musical structures (phrases, etc.) begin and end. In tonal music, harmonic and melodic conventions give very clear indicators of phrase shape and structure; these phrases are relatively easy to interpret on a very basic level. In post-tonal music, while melodic conventions are sometimes still used, harmonic conventions are not. Not only is it more difficult to determine boundaries, but also the climaxes of the phrases can be challenging to discern; deciding how to shape a phrase is a much more daunting task for performers. It is helpful to have a means of finding structural boundaries in modern music, as well as determining how the structures are shaped, that is, where the climaxes occur and how the music proceeds to and recedes from those points.

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2. Bass, 57.
What is proposed here is a multistep method that helps the performer (1) find structural boundaries on multiple levels, primarily through the observation of parametric changes; (2) find the general intensity profile of the composition’s structures through the observation of various intensity factors; and (3) graphically represent the results several different ways. The final product of the method is an intensity map. When produced according to the guidelines set forth in this chapter, such a map shows (1) an interpretation of the structure of a given piece of music on multiple levels, (2) how those levels are related to one another, (3) how they interact with one another hierarchically, and (4) the general shape of the intensity within each of the levels. The intensity map may provide the performer with a foundation for his or her personal interpretation.

This method is primarily intended to be a guide for those with underdeveloped intuition. It is not a system that will solve interpretive problems on its own but a tool that is to be used in conjunction with intuition, to whatever extent it may be capable of contributing. There will be times when the method does nearly all of the work, but it will not always automatically select boundaries or climax points for the analyst. Rather, it will limit the number of options from which the analyst can choose, making some of the decisions easier than if the analyst does not use the method. In addition, the method encourages growth of intuition. It assists the analyst in learning which aspects of a musical composition to take into consideration when making interpretive decisions.

3. Graphic representations have also been discussed by Robert Cogan and Pozzi Escot in their book, *Sonic Design: The Nature of Sound and Music* and by John Rink in “Analysis and (or?) Performance” in *Musical Performance: A Guide to Understanding*. However, their representations deal primarily with a single parameter, while those proposed here are multiparametric.

4. As mentioned in chapter 2, one of the most effective and popular techniques for performance analysis (especially of twentieth-century music) is the determination of structural function, which involves ascertaining the role an event (or qualities that event possesses) plays within a composition. While the method presented here uses the technique very little, it does help to prepare the way for analysis of structural function.
Because this method (like most forms of performance analysis) is most effective when used in conjunction with intuition, some portions of it may not be necessary for the performer/analysts whose intuition is stronger in certain areas. For example, if one can determine intensity intuitively, he or she may omit the intensity-determining portion of the method. Regardless, the method still has the potential to bring to light information that one might not have noticed using intuition alone, and thus the analyst is encouraged to employ all of the method.

A significant aspect of this method’s success is the process of developing hypotheses. Novices may be hesitant about proceeding within the method until they are absolutely sure that their initial hypothesis is correct; they should withhold this apprehension, and they should not be afraid of making hypotheses, which may later be discarded. This notion is especially important at the outset of an analysis, when least is known about the piece. During and after each of the main steps in the process (segmentation, grouping, and intensity mapping), the analyst is encouraged to assess and revise his or her conclusions. Many of the steps in this process are largely diachronic in their approach to the music. The analyst may derive great benefit from rethinking his or her decisions in a more synchronic understanding of the piece and making changes as necessary.

While the method presented here is applicable to a great deal of music, including traditional tonal works, it is intended for use on works of the twentieth century. The results of using this method on a traditional tonal work would be limited, because it omits traditional harmonic and melodic analysis. It would also be wasteful due to the consideration of parameters that are typically secondary in tonal music. In contrast, this method is especially useful for twentieth-century music. This music does not consistently utilize any common compositional
style or harmonic language, so there are no conventions upon which one can rely. The great diversity of styles within this time period makes the significance of various form and intensity indicators highly relative to context: what indicates a structural delineation in one context may be entirely insignificant in another; what is very intense in one piece may be a low point in another. By accounting for both the quality and quantity of many parameters and intensity factors based upon context, this method tailors itself to each individual piece, making it ideal for music of the twentieth century.

Beginning the Method: The Form Chart

As mentioned above, the final product of the method is the intensity map. This representation builds on a great deal of supporting information, so other representations must first be generated, beginning with the form chart. (See appendix A for an example.) The form chart is essentially a way of organizing and notating one’s understanding of the form of a work. It indicates where phrases begin and end and may include comments regarding factors contributing to those conclusions. Furthermore, it indicates which phrases combine to form phrase groups, which groups merge to form subsections, and which subsections combine to form the sections that unite to become the entire work.

*Parametric Analysis.* Before all of the formal units in a work (phrases, phrase groups, sections, etc.) can be represented, they must first be located, beginning with phrases. This can be challenging, but, by relying on some basic concepts of perception, it is a reasonably surmountable task. When determining whether or not contiguous musical elements should be

5. John Rink discusses form charts as part of a technique of performance analysis in “Analysis and (or?) Performance.”
6. While one could look for other formal units first, all of the major techniques in this method (segmentation, grouping, form chart, arch map, and intensity map) are most efficiently and accurately executed by starting at the level of the phrase. This is also the level at which musical intuition is the strongest.
thought of as part of the same phrase or different phrases, one can take into consideration how similar they are to one another. In their article, “Temporal Gestalt Perception in Music,” James Tenney and Larry Polansky assert, “In a collection of sound-elements….those which are similar (with respect to values in some parameter) will tend to form [groups], while relative dissimilarity will produce segregation, other factors being equal.” The greater the degree of change within a parameter from one event to the next, the greater the likelihood that there is a phrase boundary between those two events. Conversely, the greater the degree of similarity within a parameter from one event to the next, the greater the likelihood that there is not a phrase boundary between those two events.

This notion is part of the theory proposed by Fred Lerdahl and Ray Jackendoff in their book, *A Generative Theory of Tonal Music (GTTM)*, as part of their third “grouping preference rule.” Generalizing the rule to make it useful for the method proposed here, it can be stated: Consider a sequence of four musical events (notes, figures, phrases, etc.) $E_1, E_2, E_3, E_4$. All else being equal, the transition $E_2-E_3$ may be heard as a group boundary if the transition $E_2-E_3$ involves a greater parametric change than both $E_1-E_2$ and $E_3-E_4$ (fig. 2). The parameters in which this change may occur include (but are not limited to) register, timbre, dynamics, note duration, tempo, articulation, and instrumentation. While it is not a relative variable but one that

7. 207.
8. 46.
9. For example, formal boundaries in the music of Milton Babbitt are often marked “quite clearly by changes in certain dimensions of the music, specifically instrumentation, timbre, register, and particular kinds of pitch events” (Lake, “Listening,” 12).
is binary, change within the parameter of rest versus sound may also indicate a structural boundary.\textsuperscript{10}

With the modifications mentioned above, one can use these concepts from Tenney and Polansky and Lerdahl and Jackendoff to segment a twentieth-century composition. To identify the dissimilarity that typically indicates formal delineations, the analyst will look for parametric changes. Abrupt changes and quick, smooth changes within any parameter will suggest structural

\textsuperscript{10} Rest-indicated structural boundaries occur at the end of the rest. Perceptually, the attack point (which ends the rest) is heard as the beginning of a new structure, instead of the less obvious end of a pitch prior to a rest.
boundaries, but some changes will be more significant than others. The frequency and degree of changes within a parameter will affect how significant those changes are: rare changes and greater changes are more significant, while common changes and lesser changes are insignificant. To determine the level of significance, the analyst must tally all of the parametric changes and then categorize them by degree.

The wide variety of parameters that the analyst may take into consideration exhibits several different types of change. The parameters can be put into three different categories based on the characteristics of their changes: (1) parameters in which the degree of change may be measured; (2) parameters in which the degree of change cannot be measured, but a quantity related to the change can; and (3) parameters in which neither the degree nor a related quantity of change can be measured. The first category of parameters includes tempo, dynamics, and register. Measuring the degree of change within each of these parameters helps indicate which changes are more significant and by how much, allowing for greater precision in the ranking process. In the second category, which includes instrumentation and rest versus sound, the degree of change cannot be measured. Instead, the changes in these parameters may be ranked in terms of a related quantity. For example, within the parameter of instrumentation, the entrance of a flute cannot be considered more significant than the entrance of a viola, but the entrance of several instruments is obviously more significant than the entrance of a single instrument. Within the parameter of rest versus sound, the quantity measured is the length of the rest: longer rests

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11. Quick, smooth changes should be relatively brief (typically a beat or less). Longer, gradual changes are often more indicative of changes in intensity than of boundaries.
12. The parameters of harmonic density and note length also belong to this category. However, as will be discussed later, their changes are accounted for but not tallied.
are more significant than shorter rests. The third category includes timbre. The analyst can merely count changes over time within this parameter.\textsuperscript{13}

An additional difference among parameters is that some tend to change very definitely, so that one can easily tell where the change occurs (timbre, instrumentation, articulation, rest vs. sound), while others have the potential for relatively smooth changes (dynamics, tempo, register), so that one may have difficulty locating a specific point of change. Identifying parametric changes is not especially difficult, but the combination of these multiple considerations may present a large amount of information. To deal effectively with this data (and the many decisions that accompany it), it is necessary to impose a system for qualifying and ranking parametric changes.

To select the useful parametric changes within a piece, the analyst may tally the changes, organizing them by the quality or quantity of the change. However, changes within each of the parameters must be tallied differently. The tallying of some parametric changes requires that the analyst take each instrument into consideration individually, while for others the analyst may consider the ensemble collectively. Some parametric changes can be organized by existing conventional categories (such as the standard indications for dynamics), while for others the analyst must construct and impose a system of categorization.

(1) Because timbre changes are essentially binary in nature, they are simply counted. The analyst should do a separate tally of timbre changes for each of the instruments involved.

\textsuperscript{13} The parameter of articulations would also fall into this category. However, as will be discussed later (p. 30), articulation changes will be accounted for but not tallied. One could impose a system for ranking these types of changes, but current musical convention lacks such a system. Creating one that produces effective results representative of typical perception is beyond the scope of this paper.
(2) Instrumentation changes may have several categories: entrance or exit of one instrument, of two instruments, and so on. For example, in a piece featuring five instruments, the analyst may have up to four categories of change in instrumentation. (Entrance or exit of all five instruments would be a change in rest versus sound.) Because brief instrumental entrances or exits are unlikely to be perceived as instrumentation changes, a minimum threshold is necessary (fig. 3). An entrance or exit of an instrument should be preceded or followed (respectively) by at least two beats when the instrument is not in the texture in order to be counted as an instrumentation change. This should be long enough to account for events that listeners perceive as instrumentation changes, but not so long that significant events are excluded.  

(3) In the parameter of rest versus sound, the tally is organized by the length of the rest. There can be an infinite number of categories within this parameter, but in general, it is better to err on the side of too many categories to begin with, since they can be combined later. In that light the analyst should start with a default increment of quarter beats or quarter seconds (depending on whether the piece measures time in traditional notation or in seconds). This guideline is flexible: if the analyst decides that a different increment would be less cumbersome (yet still effective for the tally), he or she may use that instead. There is no minimum size of rest for the tally, and while there is no maximum size per se, the analyst may wish to include all rests longer than a certain size into a single category. As a default, one may use five beats as the limit beyond which rests are lumped together. This maximum is arbitrary and may be changed if the analyst finds it necessary to do so.

14. A two-beat minimum should be considered a flexible guideline. There will be cases (such as extreme tempos) in which the analyst may use longer or shorter minimums, but as a default, two beats are an acceptable minimum.
(a)

(b)

Figure 3. Instrumentation changes in Frank Ticheli’s *Back Burner* for saxophone quartet. In mm. 66–68 (a) the entrances and exits of the various voices are not perceived as instrumentation changes due to the short lengths of the rests before and after them. However, in mm. 134–37 (b) of the same work, the long rest that precedes the alto saxophone’s entrance and the long rest that follows the baritone saxophone’s exit both qualify these entrances and exits as changes in instrumentation.

(4) As the analyst accounts for register changes, he or she will take them into consideration in different manners. Register changes in monophonic instruments will be tallied, but register changes in harmonic instruments will not. Of the primary sources on which this method is based, neither deals with harmonic-instrument register changes. (Lerdahl and Jackendoff do not mention them, and Tenney and Polansky specifically state that their
techniques are for monophonic music exclusively.) Although harmonic-instrument register changes will not be tallied, the analyst should still observe registral activity in harmonic instruments, as it will be useful when he or she considers similarity and parallelism.

Monophonic instruments’ register changes may be tallied separately for each instrument of the piece. It is beneficial to first define a minimum size for a leap to be considered a register change. For example, it is highly unlikely that one would perceive the leap of a third as a register change. On the other hand, it is likely that one will perceive an octave jump as a change of register. It is difficult to set a minimum for register shifts that is applicable to all pieces, but one may use a perfect fifth, or seven semitones, as a starting point. The register-change tally is organized by the size of the jump. This organization can be based on increments of two semitones. So, for example, the analyst may tally jumps of seven and eight semitones together, nine and ten semitones together, eleven and twelve semitones together, and so forth.

As is the case with instrumentation changes, when an instrument changes register it must stay in that register for a certain amount of time to suggest a phrase boundary. It is advisable for the analyst to observe a two-beat minimum when taking register changes into consideration. For example, in m. 58 of Charles Wuorinen’s Divertimento for Alto Saxophone and Piano (fig.

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15. Research regarding register changes in harmonic instruments is limited, which makes it difficult to propose any sort of technique for tallying these changes. The creation of such a technique is a potential area for refinement of the method at a later time.
16. To avoid any tonal connotations, intervals will simply be expressed in terms of the number of semitones.
17. This is an arbitrary and flexible guideline. While one can use any size increment desired, it is important to note that the larger the increment one uses, the fewer options there are for dividing points within the category of registral change. The results may be lumped together later in the process, if necessary.
18. Also, like instrumentation changes, there may be cases in which longer or shorter minimums may be necessary, but one may use two beats as a default minimum. If one does adjust the minimum, it is advisable to do so for both instrumentation and register due to the fact that the reasoning applies equally to both parameters.
4), because the saxophone immediately returns to the upper register after it leaps to F#4 (beat two), this jump is not considered a register change for the parametric tally.\(^{19}\) Had the saxophone remained in the lower register for at least two beats, one could count the jump to C#6 as a register change.\(^{20}\)

Fig. 4. Brief register change in Charles Wuorinen’s Divertimento. In m. 58 the saxophone’s register change on beat two is too fleeting to count in the parametric tally.

(5) Dynamic changes are easily categorized by degree of change. It is clear that a change from piano to fortissimo is more significant than one from mezzo forte to mezzo piano. Therefore, a tally of dynamic changes may be organized based on the degree of change, for instance, four-level dynamic changes, three-level dynamic changes, etc.

So that no potentially significant dynamic changes are excluded from the tally, the analyst should employ a minimum of one level of dynamic change when counting, and he or she

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19. Octave designations throughout this paper will be as follows: pitches beginning at middle C and ascending will be referred to as C4, D4, E4, etc., octaves from C4 on up will be notated in ascending order (C4, C5, C6, etc.), and octaves below C4 will be in descending order (C3, C2, etc.).

20. For the purposes of this method, the definitions of remaining in a given register are as follows: if the initial jump from a register is twelve semitones or more, the instrument must stay at least twelve semitones away from the final pitch of the old register during the two-second minimum. Likewise, if the initial jump is seven semitones or more (but less than twelve), the instrument must stay at least seven semitones away from the final pitch of the old register.
should count short crescendos as one level of dynamic change unless indicated otherwise.\footnote{As a general guideline, these short crescendos should span a beat or less.} Also, the analyst will take the entire texture into consideration and always use the loudest instrument at any given time. So, if one instrument is forte and the other is mezzo piano, the analyst will consider the volume at that time to be forte until the first instrument drops out of the texture or changes volume, or if another instrument gets louder than forte.

(6) Tempo changes are tallied and may be ranked by the percent of change from the first tempo to the second. For example, a change from 120 beats per minute to 108 beats per minute (a ten percent change) is less significant than a change from 90 beats per minute to 160 beats per minute (a seventy-eight percent change). Tempo changes of five percent and greater will be tallied. (Anything less than this is unlikely to be perceived.) Also, the analyst may use categories based on five-percent increments (five percent and greater but less than ten percent, ten percent and greater but less than fifteen percent, etc.)

(7) Changes in articulation, duration, and harmonic density are not tallied, but will be taken into consideration. These parameters usually change far more frequently than other parameters, and as a result, their changes will almost always be considered insignificant. In spite of this, there are times when a change within one of these parameters is quite striking due to its relative isolation and may provide supporting information as the analyst attempts to determine where a phrase boundary exists. While it is difficult to set a specific criterion for what qualifies as an isolated change, it is beneficial for the analyst to have a guideline to follow: a change preceded by and followed by a minimum of two seconds during which there are no other changes within that parameter may be considered isolated. Such an isolated change occurs in Dana Richardson’s *Heartbreaker* for solo tenor saxophone (fig. 5). In the opening of the piece (fig. 5a)
and throughout much of the work, note lengths change frequently. However, between mm. 92 and 93 (fig. 5b) there is a change in note length that is relatively isolated from other such changes. This seclusion gives the change relatively greater importance, making it a more likely location for a phrase boundary.

Figure 5. Isolated note-duration change in Dana Richardson’s *Heartbreaker*. In the opening (a) change in the parameter of note length (indicated by Cs) is abundant. However, between mm. 92 and 93 (b), change within that parameter is rarer, making it more significant.

The significance that one may assign to an isolated change within one of these parameters (articulation, duration, and harmonic density) is limited. That is, such an isolated change alone is highly unlikely to indicate a boundary. However, in situations when two potential boundaries seem equal or there is little other information on which the analyst may base his or her decision, an isolated change within the parameters of harmonic density, articulation, or note durations can provide supporting information as the analyst attempts to make that decision.

Once all of the changes within a parameter have been counted, the divisions should be added together so that the resulting number for each category represents that division of change and all changes of greater magnitude. Doing so will organize the parametric changes to reflect their perceived significance. For example, if within the parameter of dynamics the tally reveals the following:

Five levels of change: 1
Four levels of change: 2
Three levels of change: 0
Two levels of change: 5
One level of change: 6

the results may be added together to get the following:

<table>
<thead>
<tr>
<th>Five levels of change: 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Four levels of change and greater: 3</td>
</tr>
<tr>
<td>Two levels of change and greater: 8</td>
</tr>
<tr>
<td>One level of change and greater: 14</td>
</tr>
</tbody>
</table>

This organization ensures that the analyst’s ranking for different types of changes will reflect typical perception of those changes.

One will notice that when the results are added together, the category “three levels of change and greater” is omitted. It is unnecessary to include the category in this case because no three-level dynamic changes were tallied. All of the parameters will be dealt with in this manner: if a category within a parameter features no changes, it will be grouped with the category above it. So in this case, there are technically three dynamic changes of three levels and greater, but the category is represented by the name “four levels of dynamic change and greater.”

After all of the parameters have been counted and their degrees of change ordered, they should be combined into one single list that is ordered based on frequency of occurrence of changes. For example, the list might look something like the following:

<table>
<thead>
<tr>
<th>Parametric Change</th>
<th>Number of Occurrences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Five levels of dynamic change</td>
<td>1</td>
</tr>
<tr>
<td>Four levels of dynamic change and greater</td>
<td>3</td>
</tr>
<tr>
<td>Tempo changes by forty percent and greater</td>
<td>3</td>
</tr>
<tr>
<td>Rests two beats and greater</td>
<td>4</td>
</tr>
<tr>
<td>Register changes of nineteen semitones and greater</td>
<td>4</td>
</tr>
<tr>
<td>Tempo changes by twenty-five percent and greater</td>
<td>5</td>
</tr>
<tr>
<td>Rests one and three-quarter beats and greater</td>
<td>8</td>
</tr>
<tr>
<td>Register changes of seventeen semitones and greater</td>
<td>8</td>
</tr>
<tr>
<td>Two levels of dynamic change and greater</td>
<td>9</td>
</tr>
<tr>
<td>Rests one and one-half beats and greater</td>
<td>10</td>
</tr>
<tr>
<td>Register changes fifteen semitones and greater</td>
<td>10</td>
</tr>
<tr>
<td>Instrumentation changes</td>
<td>10</td>
</tr>
<tr>
<td>Rests one and one-quarter beats and greater</td>
<td>12</td>
</tr>
</tbody>
</table>
After the changes have been organized in this fashion, the analyst may determine the levels of significance. The parametric changes will be *highly significant, moderately significant,* or *insignificant.* This differentiation will inform the analyst as to which types of changes will most likely indicate boundaries. Considerable gaps between the numbers of changes in the categories indicate possible points of division for the levels of significance. In the event that there are no considerable gaps or there are more than two, how the analyst divides the tally is somewhat arbitrary. However, the analyst should strive to divide the tally so that within the division of “highly significant” there is at least one type of change from the parameters of rest versus sound, dynamics, and register of monophonic instruments. (As a result, there will always be at least three types of change considered highly significant.) These are the parameters which feature multiple levels of change; instrumentation and tempo will also be included when they include multiple levels of change. After the analyst has chosen the divisions, they are open to revision, especially if later attempts at segmentation indicate that there are too few or too many significant changes.

This three-fold division of the significance of changes provides useful direction for the analyst without contributing an unnecessary amount of complexity. The highly significant changes will most frequently indicate boundaries, the insignificant changes will very rarely
indicate boundaries, and the moderately significant changes will sometimes indicate boundaries, usually in conjunction with other moderately or highly significant changes. By using only these three divisions (as opposed to two or four), the method may better provide clear-cut direction to the analyst (highly significant changes most frequently indicating boundaries, insignificant changes almost never indicating boundaries) while still allowing a degree of flexibility to accommodate the integration of intuition and some discretion on the part of the analyst. Having only two divisions restricts this flexibility, and creating more divisions reduces the clear-cut aspects of this portion of the method.

To illustrate the process of assigning the points of division, one may return to the results of the parametric tallies above. The gap between the number of tempo changes by twenty-five percent and greater (5) and the number of rests one and three-quarter beats and greater (8) is a likely location for the dividing line between highly significant and moderately significant changes. The dividing line between moderately significant and insignificant changes could be drawn after the one-level-and-greater dynamic changes, leaving register changes of seven to eleven semitones and rests less than a beat as the insignificant parametric changes. After the analyst has determined dividing points, the parametric changes within each level of significance may be combined so that each parameter is only listed once in each level of significance.

Combining the above example would yield the following:

<table>
<thead>
<tr>
<th>Highly Significant</th>
<th>Moderately Significant</th>
<th>Insignificant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Four levels of dynamic change and greater</td>
<td>Rests one beat and greater but less than two</td>
<td>Register changes seven to twelve semitones</td>
</tr>
<tr>
<td>Tempo changes twenty-five percent and greater</td>
<td>Register changes thirteen to eighteen semitones</td>
<td>Rests less than one beat</td>
</tr>
<tr>
<td>Rests two beats and greater</td>
<td>Dynamic changes of one and two levels</td>
<td></td>
</tr>
<tr>
<td>Register changes nineteen semitones and greater</td>
<td>Instrumentation changes</td>
<td></td>
</tr>
</tbody>
</table>
While parametric changes will typically be assigned a fixed level of significance throughout the duration of an analysis, it is at times necessary to demote certain changes. If a parameter suddenly exhibits a great deal of change within a short period of time, its influence will diminish for that span of time. As will be discussed later in this chapter (in the section Phrase-Length Conventions), this performance-analysis method will generally disallow phrases less than five seconds long. The rule regarding demotion of parametric changes is based on this interval of time: if ten percent or more of the same type of changes within a highly significant parameter occur within a span of four seconds, those changes are demoted and cannot be used for purposes of segmentation. (There must be at least two changes.)

Motivic and Pitch Analysis. In addition to doing a parametric analysis of the piece, the analyst should also do a motivic and pitch analysis. This includes looking for contiguous motives and being observant of any pitch or pc-set trends. Similar motives adjacent to one another should be grouped together. For example, in the opening of the first movement of Guy Lacour’s Suite en Duo (fig. 6), the first four measures belong together in the same phrase due to the motivic relationships that are present. Likewise, adjacent material with similar pc sets should be grouped together, as occurs toward the end of the cadenza section of Alfred Desenclos’s Prélude, Cadence et Finale (fig. 7). Adjacent material that is dissimilar in terms of pitch or pc-set material is less likely to be grouped together than adjacent material that is similar in those terms.

22. Although establishing such a technique is beyond the scope of this paper, it is possible that a parametric change could be promoted due to its relative isolation. This technique would be similar to the manner in which the analyst accounts for articulations, pitch durations, and harmonic density, but it would require guidelines for comparing the degree of isolation of one change to the degree of isolation of other changes within the parameter.
Figure 6. Motivic similarity in Guy Lacour’s *Suite en Duo*. The first four measures are grouped together (indicated by the bracket above) due to the related motives.

Figure 7. Pitch-class set relationships in Alfred Desenclos’s *Prélude, Cadence et Finale*. Near the end of the cadenza, material featuring pc-set class (0258) (sets [57t1] and [e147]) is grouped together, not with the material that follows it, which is a member of pc-set class (0134679t).

Besides appearing contiguously, motives frequently exist isolated from one another, in which case they may function in the same manner within their respective structures, producing parallelism between them. For instance, if a motive first appears at the beginning of a phrase, it is likely to reappear at the beginning of a later phrase; those nonadjacent phrases will be considered parallel. Figure 8 illustrates this. In the first movement of the Sonata for Alto Saxophone and Piano by Edison Denisov, the motive that appears at the beginning of the movement (labeled “a”) returns twice: once at m. 42 (labeled “b”) and once at m. 100 (labeled “c”). Each of those

23. This paper uses a notation system similar to Joseph Straus’s to differentiate prime and normal form: prime-form sets use parenthesis, while normal-form sets use brackets (*Post-Tonal Theory*, 31–33, 49–50). Additionally, when octave placement is not important pitches will be referred to using a mod-12 integer-notation system as follows: all Cs and their enharmonic equivalents will be 0, all C#s and their enharmonic equivalents will be 1, and so on through A, which will be 9. All Bbs and their enharmonic equivalents will be t (for ten) and all Bs and their enharmonic equivalents will be e (for eleven) (*Post-Tonal Theory*, 3–5). (This notation is not applicable to prime-form numbers, which use numerical notation to define pc relationships from a standard reference point.)
reappearances begins a new phrase, functioning in the same manner as the first appearance. The motivic material takes on a presentational function within its phrase.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{motivic_return.png}
\caption{Motivic return in Edison Denisov's Sonata for Alto Saxophone and Piano. In the first movement the motive from the beginning of the piece (a) returns twice (b) and (c).}
\end{figure}

\textit{Phrase-Length Conventions.} An analyst who understands typical phrase-length conventions will be better equipped for finding phrase endings, helping him or her to analyze a piece more efficiently. Additionally, as the analyst becomes more familiar with phrase-length conventions, his or her intuition regarding phrase lengths will improve. As a general rule, phrases should typically be between five and thirty-seven seconds long when the analyst is doing the initial segmentation. This guideline is based on tonal phrase lengths.\textsuperscript{24} Although tonality and metric regularity are rarer in twentieth-century music than in music of previous periods, listeners are accustomed to hearing phrase lengths as they exist in metrically regular pieces. As a result of this habituation, it is advisable for performers to develop an interpretation that features phrases of lengths similar to what listeners are used to hearing. Once the analyst has segmented enough

\textsuperscript{24} Four measures of common time at a tempo of 176 beats per minute would be about five seconds long, while eight measures of common time at a tempo of 52 beats per minute would be roughly thirty-seven seconds in length.
phrases to determine an average phrase length, these length restrictions will be replaced by limits produced using the phrase-length average (which will be discussed in the sections Segmentation and Determining Boundaries with a Phrase-Length Window).

The limitations presented above are the outermost boundaries of phrase durations. While extremely short or extremely long phrases are acceptable, they are not preferred. Most phrases should be notably longer than five seconds and shorter than thirty-seven seconds, preferably somewhere between ten and thirty seconds. If a segment is between five and ten seconds long, the analyst may consider combining the segment with adjacent material using the guidelines for combining subphrases with neighboring material (discussed below). Likewise, if a segment is between thirty and thirty-seven seconds long, the analyst may look for a reasonable dividing point within the segment. The decision to combine short segments or split a long one should be supported by reasonable justification. Because this is simply a guideline, the analyst should not combine or split only because a segment is not between ten and thirty seconds in length.

In some cases, the analyst may encounter subphrases. These are defined by their length (significantly shorter than surrounding phrases) and their boundaries (similar to phrase boundaries but typically weaker). If a segment of music exhibits these qualities, it is considered a subphrase and should either: (1) unite with an adjacent phrase to form a larger phrase (which might be longer than most other phrases); or (2) stand alone as a subphrase, which will be combined on a higher level with an adjacent phrase into a phrase group (discussed later).

The factors that determine which one of these options is best include strength of boundary, similarity, and parallelism. Adjacent segments featuring a weak boundary are more likely to be combined than those featuring a strong boundary. Greater quantities of change at a

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25. These limits are arbitrary guidelines, which the analyst may modify if he or she finds it necessary to do so.
single point and greater degrees of change both contribute to strong boundaries. When comparing changes within the same parameter, the larger, more drastic change will always suggest a stronger boundary.

When one compares changes within different parameters, the decision is slightly more complicated. Obviously, a change’s level of significance indicates how strong it is compared to other types of changes (e.g., a highly significant change in one parameter is always considered stronger than a moderately significant change in another), but there may be cases in which the analyst must compare two changes of equal significance (both highly significant or both moderately significant). In such a case, the analyst should compare the number of occurrences of each of the types of changes (from the combined tally) and choose the less frequent change as the stronger boundary. However, to avoid dealing with incremental, inconsequential differences, the less frequent change should occur less than half as often to qualify as the stronger boundary. So, for example, if one type of change occurs 25 times, the only type of change within a different parameter that may qualify is one occurring 12 times or less.

In addition to strength of boundaries, the analyst should also consider parallelism and similarity of material: similar adjacent segments are more likely to be combined than dissimilar adjacent segments. (The converse is also true: the more dissimilar two adjacent phrases are, the less likely it is that they will be grouped together.) This similarity may be in terms of motivic, pitch, or pc relationships, or within any of the tallied parameters. Lastly, when possible, the analyst should combine segments to create phrases that are structurally parallel to other phrases within the piece, especially when they are related to one another in some way.
Segmentation. The process of segmentation involves dividing the piece into formal units of relatively similar size. This is done by determining where structural boundaries occur, usually indicated by significant changes. To begin the technique of segmentation, the analyst should first go through the piece and locate the highly and moderately significant changes and mark them, either directly on the score (fig. 9, p. 42) or in a chart (fig. 11b, p. 49). This step should be done systematically: the analyst is advised to look through the piece several times, focusing on only one or two parameters each time. Doing so will decrease the likelihood that the analyst will miss changes.

There may be cases in which the initial segments are either too short or too long for use in the calculation of the phrase-length average. If the initial segments are too short (less than 5 seconds), the analyst must combine them with adjacent units to create segments that are of adequate length. This is done in a fashion similar to how subphrases are combined with adjacent material, considering similarity, strength of boundaries, and parallelism. On the other hand, if any of the initial segments are too long (over 37 seconds), the analyst should split them.  

The best way to do this is to consider moderately significant changes as indicators of boundaries. If none produce viable splitting points, the analyst should also consider insignificant changes, isolated nontallied parameters, or both. Of the potential splitting points produced, the analyst should choose the one featuring the strongest boundary, separating dissimilar material, promoting parallelism among material, or a combination of these. Whichever of these factors is most applicable should be favored as the decision-maker, but all else being equal none of these is ultimately superior to the others.

26. When splitting a long segment, the analyst should be careful not to create a segment that is too short in the process. For example, breaking a forty-second segment into a thirty-six-second segment and a four-second segment essentially replaces one problem with another.
After marking the score or creating a chart, the analyst should calculate an approximate phrase-length average using the first several segments delineated by strong boundaries. This average is simply calculated by adding the lengths of the segments together and dividing by the quantity. The exact number of phrases used to calculate the average is up to the analyst. The fewer phrases one uses, the greater the possibility that the estimated average misrepresents the actual overall average. However, using more phrases may simply take more time without improving the accuracy of the estimate. As a general guideline, the analyst may wish to use four to six phrases to determine the average.

_Illustration of the Parametric Tally and Initial Segmentation._ An analysis of the first five lines of Christian Lauba’s _Hard_ (fig. 9) for solo tenor saxophone illustrates the techniques of parametric tally and the initial segmentation.27 A tally of the different parametric changes in the first five lines reveals the following:28

<table>
<thead>
<tr>
<th>Parametric Change</th>
<th>Number of Occurrences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rests three seconds and longer</td>
<td>2</td>
</tr>
<tr>
<td>Rests two seconds and longer</td>
<td>3</td>
</tr>
<tr>
<td>Six levels of dynamic change</td>
<td>5</td>
</tr>
<tr>
<td>Timbre</td>
<td>6</td>
</tr>
<tr>
<td>Five levels of dynamic change and greater</td>
<td>7</td>
</tr>
<tr>
<td>Eighth-note rest and longer</td>
<td>9</td>
</tr>
<tr>
<td>All rests</td>
<td>10</td>
</tr>
<tr>
<td>Four levels of dynamic change and greater</td>
<td>11</td>
</tr>
<tr>
<td>Three levels of dynamic change and greater</td>
<td>12</td>
</tr>
<tr>
<td>Two levels of dynamic change and greater</td>
<td>13</td>
</tr>
<tr>
<td>One level of dynamic change and greater</td>
<td>17</td>
</tr>
</tbody>
</table>

---

27. For purposes of brevity, this analysis only uses the first five lines of _Hard_. In practice the analyst tallies changes throughout the entire work.
28. Due to the fact that the saxophone produces multiphonics in this excerpt (and thus acts as a harmonic instrument), register changes are not included in the tally. Even in the few brief monophonic passages, nearly all of the register changes are too brief to qualify. (The only register change that does qualify is the jump to Bb6 in the fifth system.) However, the analyst may consider register when accounting for similarity or parallelism.
Figure 9. Parametric tally and initial segmentation of *Hard* by Christian Lauba. The first five lines are marked with the following indicators of change: A refers to change in dynamics; B refers to a rest; C refers to change in timbre. Bold letters represent highly significant changes, italicized letters represent moderately significant changes, and plain capital letters represent insignificant changes. Numbers indicate reference points for discussion.
The next step is to determine which of the parametric changes are highly significant, which are moderately significant, and which are insignificant. The relatively wide gaps between parametric-change frequencies occur after five levels of dynamic change and greater (7) and two levels of dynamic change and greater (13). To obtain a relatively even balance, one may divide the parametric changes as follows:

<table>
<thead>
<tr>
<th>Highly Significant</th>
<th>Moderately Significant</th>
<th>Insignificant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rests two seconds and longer</td>
<td>rests up to but not including two-second rests</td>
<td>One level of dynamic change</td>
</tr>
<tr>
<td>Timbre</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Five levels of dynamic change and greater</td>
<td>Two, three, and four levels of dynamic change</td>
<td></td>
</tr>
</tbody>
</table>

As previously mentioned (pp. 35–37), the analyst should also do a motivic and pc analysis of the work. A brief examination of *Hard* reveals some motivic and dynamic relationships. Most notable of these is the recurrence of monophonic, accented, staccato sixteenth notes throughout the first five lines of the piece. These occur at reference points 0 and 2 as low Bbs and later as short, melodic fragments at reference points 3, 7, and 8. There is also a pattern of alternation between extremely loud dynamics (forte, fortissimo, and fortississimo) and very quiet dynamics (piano, pianissimo, and pianississimo), with very little material at any sort of middle dynamic (mezzo piano or mezzo forte). This alternation between loud and soft is most prevalent and regular in the first three lines of the excerpt.29

As one surveys the marked score, it becomes clear that although timbre changes are considered highly significant, none will indicate boundaries. This is due to the fact that they all occur in such a brief period of time. The first two timbre changes are roughly two seconds apart (end of line 3, beginning of line 4), the next two are about one second apart (line 4), and the last two are a little under two seconds apart (line 4). In each case about 33% of the timbre changes

29. A pitch or pc-set analysis is not relevant in this example due to the fact that it does not feature any consistent use of sets, nor are there any notable patterns within the pitch material.
occur in a span of time under four seconds, which ends up demoting all of them. (See the discussion of demotion on p. 35.)\(^{30}\)

With all of this information, it is possible to begin segmenting the first five lines of *Hard*. The highly significant changes indicate that the analyst should impose boundaries at reference points 1, 2, 3, 4, 5, 6, 8, and 9. The boundaries at 1, 2, 3, 4, 5, and 6 are indicated by a dynamic change of five levels or greater, while those at 6, 8, and 9 are indicated by rests two seconds and longer. (The boundary at 6 is indicated by both a dynamic change and a rest.)

With the results of the initial segmentation, the analyst may determine an approximate phrase-length average using the first four to six phrases. (This particular analysis will use six.)

Boundaries at the above-mentioned locations in *Hard* create segments of the following lengths:

<table>
<thead>
<tr>
<th>Segment</th>
<th>Length in seconds</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–1</td>
<td>.972</td>
</tr>
<tr>
<td>1–2</td>
<td>5</td>
</tr>
<tr>
<td>2–3</td>
<td>14.361</td>
</tr>
<tr>
<td>3–4</td>
<td>2.222</td>
</tr>
<tr>
<td>4–5</td>
<td>4</td>
</tr>
<tr>
<td>5–6</td>
<td>5.778</td>
</tr>
<tr>
<td>6–8</td>
<td>16.084</td>
</tr>
<tr>
<td>8–9</td>
<td>11.388</td>
</tr>
</tbody>
</table>

Of the first six segments delineated by the initial segmentation, three are shorter than the recommended phrase length (between 5 and 37 seconds). These results mean that revision is required.

In order to resolve the issue of having segments that are too short (less than 5 seconds), the analyst should combine short segments with adjacent segments to form units of adequate length. Segment 0–1, the first undersized segment, can only be combined with the next segment, 1–2. As previous discussion indicated, a motivic pattern exists in this excerpt, and this

\(^{30}\) Intuitively, an experienced interpreter will understand these uses of fluttertongue as decorative as opposed to structurally functional.
configuration emphasizes the parallelism between and further promotes the motivic function within segments 0–2 and 2–3: both begin with monophonic, accented, staccato sixteenth notes at a fortissimo dynamic, followed by sudden, multiphonic, quiet (piano, pianissimo, or pianississimo) material. Furthermore, the saxophone begins in the lowest register and ascends through the duration of the segment for both 0–2 and 2–3. The low-Bb motive functions as an initiating figure, while the long, soft, multiphonic motive concludes the structure.

The other segments of music too short to be phrases were segments 3–4 (2.222 seconds), and 4–5 (4 seconds). When one initially considers the first of these, it is unclear whether it should be combined with 2–3 or 4–5. To decide which choice is better, the analyst should consider the strength of the boundaries, similarity, and parallelism. The boundaries at 3 and 4 are comparable: both feature highly significant dynamic changes. However, point 4 features a six-level dynamic change, while point 3 features a five-level dynamic change. This suggests that it might be better to combine 3–4 with 2–3. The degree of similarity in this case is negligible: neither of the segments adjacent to 3–4 is significantly more similar to it than the other. However, consideration of parallelism provides the strongest direction as to what action is best: eliminating the boundary at point 3 would disrupt the parallelism between the first two segments. As a result, the best option is to combine 3–4 with 4–5. Doing so creates a third segment that is loosely parallel to the first two: 3–5 begins with loud, staccato, accented sixteenth notes, and ends with a long, soft note. The resulting length of the segment is 6.222 seconds.

The next three segments (5–6, 6–8, and 8–9) are all at least five seconds long, and they make up the remaining three segments of the initial segmentation, the final result of which is as follows:

<table>
<thead>
<tr>
<th>Phrase</th>
<th>Start</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phrase 1</td>
<td>0–2</td>
<td>5.972 s</td>
</tr>
<tr>
<td>Phrase 2</td>
<td>2–3</td>
<td>14.361 s</td>
</tr>
</tbody>
</table>
Using this information the analyst may determine a phrase-length average by adding the durations of the phrases together and dividing by the number of phrases. In this case, the average phrase length is 9.968 seconds (59.805 seconds divided by 6 phrases).

As this illustration shows, by tallying and categorizing the parametric changes, the analyst can create an initial segmentation that will be used to determine a phrase-length average. In the process of the initial segmentation, the analyst will have to consider information in addition to the parametric tally, including (but not limited to) parallelism and motives.

**Determining Boundaries with a Phrase-Length Window.** Once the analyst has found the phrase-length average, he or she should use it to establish a phrase-length window, which will help in the segmentation of the piece. The concept of the phrase-length window is based on the notion that phrases should typically be similar in terms of duration, so they are not confused with other formal structures. (One characteristic that helps to identify formal units is length.) Phrases will often vary in length, but should usually be between half and twice the duration of the average phrase. The phrase-length window is created based on this guideline, which figure 10 illustrates: if the approximate phrase-length average is four measures long, most phrases will be between two and eight measures in length (the dotted line indicates the range within which most phrases will end). It is within this span of time (m. 2 to m. 8, in the case of figure 10) that the analyst should look for the strongest boundary.31

<table>
<thead>
<tr>
<th>Phrase</th>
<th>Range</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>3–5</td>
<td>6.222 s</td>
</tr>
<tr>
<td>4</td>
<td>5–6</td>
<td>5.778 s</td>
</tr>
<tr>
<td>5</td>
<td>6–8</td>
<td>16.084 s</td>
</tr>
<tr>
<td>6</td>
<td>8–9</td>
<td>11.388 s</td>
</tr>
</tbody>
</table>

31. While the analyst should also take similarity and parallelism into account when using the phrase-length window, he or she should first consider boundary strength.
As the boundaries of 5 and 37 seconds for the initial segmentation provided extreme limits for phrase lengths (presented in *Phrase-Length Conventions*), the phrase-length window provides the outermost boundaries for most phrases. To help keep phrase lengths closer to the average, a preference guideline is necessary. While phrases that are 50% to 200% the length of the average are acceptable, one should prefer them to be within 60% to 180% of the length of the average. If one segments a phrase outside of this preferable range, he or she should look for reasons to combine it with adjacent material (if it is too short) or split it (if it is too long).32

While the analyst should nearly always choose a boundary within the phrase-length window, there may be cases in which he or she may look outside of it for a boundary. This should only be done in extreme cases where there are absolutely no boundaries that stand out as strongest, there are notably strong motivic or pc relationships requiring heightened attention to similarity or parallelism, or a combination of these factors.

Structural boundaries in music of the twentieth century are not always clear cut or perfectly aligned. While boundaries featuring parametric changes aligned at a single point are preferable, the analyst may consider changes spread over a brief span of time. Because wider-

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32. Once the analyst begins using the phrase-length window, this guideline will replace the earlier guideline promoting phrases of 10 to 30 seconds in length.
spread changes create weaker boundaries, the analyst should keep this span relatively short.\textsuperscript{33}

Several neighboring changes will often be strong enough to qualify as a boundary, and if possible, the analyst should choose a specific point within that span of time to serve as a boundary. When choosing this point, the analyst should primarily use similarity to determine what option is best, but he or she may also use parallelism. (Strength of boundary is likely to be of little help in such a situation.)

An example of a boundary that exists over a short span of time occurs in Charles Wuorinen’s Divertimento for Alto Saxophone and Piano. In mm. 29–30 (fig. 11a and 11b) there are several changes over a brief period of time. While they do not line up perfectly, their close proximity to one another still indicates a phrase boundary.

In some cases, more than one option may exist for the strongest boundary. When this happens (all else being equal), the analyst should compare the boundary options to one another and choose the point that indicates the strongest division between phrases. As with subphrase divisions, the analyst should in this case take strength of boundaries, degree of similarity, and parallelism into consideration. These will often provide significant clues regarding the best location for a structural boundary. There is no reliable rule when it comes to determining which of these indicators is most influential as a contributor to the decision-making process. Rather, the analyst should decide which conclusion will create the greatest overall effect of change within the context. In some cases no boundary will clearly stand out as the strongest. It is in these cases that the analyst should use his or her intuition to choose one. As mentioned in the introduction,

\textsuperscript{33} A three- or four-beat limit is likely sufficient. However, this is an arbitrary guideline, and analysts are welcome to decide for themselves what span of time will be most effective as a limit.
this method (like most performance analysis) is most beneficial when it is used in conjunction with intuition.

As the analyst continues segmenting phrases using the phrase-length window, he or she may wish to refigure the phrase-length average. Doing so with the most recently segmented phrases will help to refine the phrase-length average and promote more consistent phrase lengths. Length can be a helpful additional criterion when defining and discerning hierarchical units (phrases, phrase groups, subsections, etc.) from one another.

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34. As mentioned previously, rest-indicated boundaries occur at the end of the rest.
**Grouping Phrases.** Once the analyst has delineated the phrases and entered them into the form chart, he or she should combine them to form groups. Grouping is executed in the same fashion as combining subphrases: the analyst considers similarity, strength of boundaries, and parallelism to decide which phrases should be combined to form groups.

Figure 12 helps to illustrate the concept of phrase grouping. In the opening of the second movement of Edison Denisov’s Sonata for Alto Saxophone and Piano, phrase 2 should be grouped with phrase 1 instead of with phrase 3 largely due to the stronger boundary and greater dissimilarity between phrases 2 and 3. The number of voices changes, and there is a sudden, large dynamic change (albeit brief). Furthermore, phrases 1 and 2 are similar to one another in that they both feature pitch classes [89te0] and focus melodically on set class (012), while phrase 3 focuses almost entirely on one pitch, F5.

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35. In order to create a hierarchy that clearly and logically represents the music, the “grouping well-formedness rules” (GWFRs) described by Lerdahl and Jackendoff in chapter 3 of *GTTM* should be adhered to when segmenting and grouping any piece of music. These rules are as follows: “GWFR 1 Any contiguous sequence of pitch-events, drum beats, or the like can constitute a group, and only contiguous sequences can constitute a group….GWFR 2 A piece constitutes a group….GWFR 3 A group may contain smaller groups….GWFR 4 If a group \( G_1 \) contains part of a group \( G_2 \), it must contain all of \( G_2 \)….GWFR 5 If a group \( G_1 \) contains a smaller group \( G_2 \), then \( G_1 \) must be exhaustively partitioned into smaller groups.” (37–39)

36. Depending upon how the analyst divides the tally of rests within this movement, it is possible that a rest of one and three-quarters of a beat would be considered highly significant, while a rest of one and one-half of a beat would be considered moderately significant, which would further promote the grouping of phrases one and two together.

37. There is also a strong relationship between phrases 1 and 3 in terms of density and rhythm. (The rhythmic likeness of phrase 3 to phrase 1 is striking. Its initial multiphonic and the last 5:4 figure are diminutions of the first phrase’s respective portions, while the middle 5:4 figure is a rhythmic augmentation.) Because phrase 1 begins the phrase group of which it is a part, this recurrence suggests that phrase 3 will also begin the phrase group to which it belongs. Further, this similarity supports the idea that phrase group 1 and phrase group 2 will be combined at the next hierarchical level up.
Figure 12. Phrase grouping in Edison Denisov’s Sonata for Alto Saxophone and Piano. In the opening of the second movement, phrases 1 and 2 are grouped together to form phrase-group 1. (The piano rests for this portion.)

It is best for the analyst to put phrases into groups as often as possible. However, in some cases a phrase will not combine with any adjacent phrases. It may be too dissimilar from adjacent phrases or separated from adjacent phrases by boundaries that are too strong or both. If this is the case on both sides of a phrase, it will stand alone. In figure 13, it is clear that, due to its contrast to both of the phrases adjacent to it, phrase 2 cannot be put into a phrase group with phrase 1 or phrase 3. Phrase groups may contain more than two phrases, although grouping in twos is preferable to larger groupings.\(^{38}\) If necessary, grouping in threes is acceptable. In some cases there may not be a strong enough break between any of the phrases to promote any sort of division, or (as is the case in figure 13) two phrases may frame a highly dissimilar phrase.

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\(^{38}\) As Lerdahl and Jackendoff state, “intuition seems to support…grouping…by twos, in the absence of evidence to the contrary.” (\textit{GTTM}, 328)
Figure 13. Example of an ungrouped phrase in William Albright’s Sonata for Alto Saxophone and Piano. Between rehearsal letter I and the fifth measure after rehearsal letter K (measures are not numbered due to unmeasured sections throughout the piece), neither phrase 1 nor phrase 3 may group with phrase 2, due to the high degree of dissimilarity between phrase 2 and the others.

Once the analyst has merged phrases to form groups, he or she must combine the groups to form subsections or sections, the term depending on the size of the piece. It is at this level that ungrouped phrases may be accounted for, grouping them with phrase groups to form sections or subsections. The combining of groups follows the same guidelines as phrase grouping: those groups that are similar to one another and those groups featuring relatively weaker boundaries combine to form subsections. The analyst should also consider parallelism. As the analyst continues up the hierarchical ladder, eventually only the sections are left, which are united to form the entire piece. At all of these levels (phrase group, subsection, section), the analyst should enter the results into the form chart.

*Returns and Parallelism between Sections.* In some cases, there may be a correspondence from one section to another in a piece that creates a parallelism and indicates that the segmentation within those sections may be similar. (The analyst should be aware that parallelism
may occur between contiguous sections as well as noncontiguous sections.) As is the case with
the treatment of segments or subphrases, the more parallel the material is between sections, the
more similarly to one another those sections should be segmented and grouped. The
correspondence might be in terms of thematic material, usage of rows, motives, or pitch
collections, among others. When at all possible, it is important for the performer/analyst to
accurately observe parallels in the music. As Lerdahl and Jackendoff state, “The importance of
parallelism in musical structure cannot be overestimated. The more parallelism one can detect,
the more internally coherent an analysis becomes, and the less independent information must be
processed and retained in hearing or remembering a piece.”

Further, the more coherent an analysis becomes, the more coherent a performance based on that analysis will be, increasing the
listener’s comprehension.

One form of correspondence between sections is that of the thematic return. While
somewhat rarer in twentieth-century music than in music of other time periods, thematic returns
do occur. An example of this is in Piet Swerts’s *Klonos* for alto saxophone and piano (fig. 14).
The theme from the opening of the work returns with only slight alterations after a slow middle
section, indicating that the first section of the work has returned as a sort of recapitulation. This
large sectional relationship may have consequences for lower levels. Most significantly, the later
section will likely be segmented and grouped in a similar fashion to the earlier section.

In some cases a twelve-tone row may be used instead of a theme. Figure 15 illustrates this with
the first movement of Webern’s Quartet opus 22. In mm. 6–10 (a) the saxophone presents row
form P₁ (members of which are labeled 1–12), which returns in mm. 28–33 (b) in the violin,

40. One should be aware that twentieth-century thematic returns are generally more varied than
returns in traditional, tonal music, which makes them more difficult to identify.
clarinet, and saxophone, indicating a return of the section that it introduces.\(^{41}\) (Although there is some octave displacement in the return, the rhythm in which the row originally appeared returns, helping to bring out the correspondence.) In this example, the row returns in its original form, but it may reappear in some modified form, such as retrograde, inversion, or a combination of the two.\(^{42}\) An analyst of twentieth-century music must be observant of such operations.

(a)

(b)

Figure 14. Return of a theme in Piet Swerts’s *Klonos*. Thematic material from the opening (mm. 6–15; labeled a) returns later in the piece as a recapitulatory statement (mm. 118–27; labeled b).

\(^{41}\) This sectional return is mentioned by Brian Fennelly, “Structure and Process in Webern’s Opus 22,” and Leland Smith, “Composition and Precomposition in the Music of Webern.”

\(^{42}\) A row reappearing in retrograde or inverted form is far less likely to signal a return unless it is accompanied by additional factors that indicate significant correspondence.
These sectional relationships indicated by themes, rows, and sometimes motives can be very helpful in determining boundaries. How one section is grouped will have an impact on how one decides to group a section related to it. The performer/analyst should take this into consideration when grouping various formal units within a piece.

Revision. When the analyst has finished segmenting the piece, he or she may wish to check the results against his or her intuition. If the analyst is confident in his or her intuition and it disagrees with the results, it may be necessary to go back and revise certain aspects of the process. This may include (but is not limited to) adjusting what types of changes suggest boundaries (considering more or less changes to be highly significant), giving similarity or parallelism greater consideration when grouping, or adjusting the allowed amount of deviation in length from one phrase to the next (adjusting the phrase-length window). As one revises, he or
she should be sure that all revision is done within the boundaries of the method. It is inadvisable to simply abandon the method in favor of intuition. The analyst should always allow the method and his or her intuition to work together to come to a reasonable conclusion.

Arch Map

After completing the processes of segmentation and grouping and entering the results into the form chart, the analyst may begin creating a graphic representation. The first representation to produce is the arch map. This is simply a graph that represents the various formal units of the music with arches. The analyst may begin by depicting the phrases (fig. 16), after which more arches may be drawn above, combining them into larger groups at the next level of hierarchy, the phrase group. This is continued according to the data in the form chart until the point at which the entire piece may finally be placed under one large arch (see appendix B). The finished product is a graphic representation of the grouping on various levels of the structural hierarchy. It provides the performer with a visual image of how the composition is divided up at many different levels and what musical events are related to one another as members of the same group.

Figure 16. Arch map. This example depicts segmentation at the level of the phrase with numbers indicating measures. Arches above represent phrases.

Intensity Map

The final step in creating the intensity map involves determining the points of greatest intensity, which are the locations within each arch toward which the music drives and from

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43. This type of representation is used by Jonathan Helton in his articles “Edison Denisov’s Sonata for Saxophone and Piano” and “Historical and Analytical Perspectives for the Performer on Luciano Berio’s Sequenza IXb,” as well as by Lerdahl and Jackendoff in GTTM.
which it recedes. Also known as the climax, this is the point at which the intensity is greatest or where the release of the intensity occurs. The ebb and flow of intensity is a major part of what gives music its motion or its drive. Without it, music is static and bland. It stands to reason that performers would want to use their knowledge of the distribution of intensity to determine how they will perform phrases so as to make the most of the climaxes.

According to Wallace Berry, the aspects of music that generally contribute to greater intensity include ascending melodic motion, shorter note durations, metric instability, acceleration, increased density, higher dynamics, higher registers, and a greater degree of percussiveness (fig. 17). Nearly all of these aspects of music are introduced in relative terms, because intensity is largely relative: what is very intense in one context may only be considered moderate in another. Further, each of these aspects of music that may contribute to intensity is relative both in terms of quality and quantity: quality is essentially the degree of change that creates intensity, while quantity is how long the intensity is increased. So, for example, ascending melodic motion by leap creates greater intensity than ascending melodic motion by step (quality). Likewise, ascending melodic motion for several beats creates more intensity than if it is for a single beat (quantity). These aspects of music that contribute to intensity may be thought of primarily as guides. As Berry asserts, “While any premature statement in the direction of classification of intensity values within elements of music is inevitably too simple, it can be useful if read as suggestive.”

When considering these intensifiers, the analyst should be aware that most take all voices of a texture into consideration. For example, increased dynamics in one voice will contribute to an overall perceived increase in volume, creating more intensity. The same is true for all

44. Structural Functions, 11.
45. Ibid., 10.
intensifiers but melodic motion, in which case only the primary melodic voice is taken into consideration. It is important to note that the instrument considered to be the primary melodic voice may change frequently throughout a piece.

These suggestive guides can help identify an actual climax point within each structure to which the intensity drives and from which it recedes. This location generally has three characteristics: (1) a relatively higher saturation of intensifiers than other locations within that structure, (2) a buildup of intensity that occurs just before it, and (3) a release of intensity that follows it. If a location exhibits these three characteristics, it is most likely the climax.

To help reinforce his or her intuition, the analyst may wish to make an intensity chart. This type of graphic representation will show the buildup and release of intensity as well as the points at which multiple intensifiers line up, producing locations of greatest intensity. To create the chart, the analyst may examine each of the possible parameters that contribute to increased

Figure 17. Illustration of intensifiers.
intensity. For durations, register, density, and percussiveness, at each place in the music where the intensity heightens, the analyst may mark the chart at that location, indicating the active intensifier. When specifying locations of intensifiers, the analyst may wish to go so far as to indicate by the half beat (as is done in the examples discussed here), but getting any more specific than that is not usually necessary. For melodic motion and dynamics, the analyst may employ hairpins (graphic crescendo and decrescendo markings) to show any gradual increases or decreases in intensity. The end result will be something like figure 18 (p. 62), a discussion of which follows.

After creating the intensity chart, the analyst must interpret it to determine the intensity shape of the phrase. In doing so, he or she must compare the alignment of intensifiers with the buildup and release for potential climax points. The strongest alignment of intensifier is usually the one with the most intensifiers. However, quality must also be taken into consideration. A climax should also feature the highest dynamics, the shortest note durations, and the highest register.

A strong alignment of intensifiers alone will not define the intensity shape for an entire phrase. A buildup and release are also necessary. A buildup in intensity may be indicated by increasing numbers of intensifiers, opening hairpins, or both, and the release may be indicated by the opposite. Just as when examining an alignment of intensifiers, the analyst may compare buildups to one another in terms of quantity and quality. The preferable buildup will feature a greater increase in intensity. This includes having a larger melodic ascent and a more dramatic increase in dynamics and density. The preferable buildup will also be smoother (free of

46. Increases in dynamic intensity may also be indicated by marks on the chart similar to those used for other intensifiers, especially in those cases where the change in dynamics is abrupt. Also, the final pitch of an ascending line (the melodic peak) is considered part of the ascending motion and is counted as an intensifier.
decreases in intensity) and longer so as to best match the duration of the structure of which it is a part.\(^\text{47}\) These rules are applicable when comparing buildups at any hierarchical level.

To account for this information the analyst may tally each of the intensifiers at the locations where they align. As he or she does so, the buildup to and release from a potential point may each count as an added intensifier to that point. So, if there are three aligned, single-point intensifiers and a buildup to and release from that alignment, the total intensifier count at this location is five.

If considering perfectly aligned intensifiers fails to yield clear results, the analyst may wish to consider a brief window containing neighboring intensifiers. For example, if two different types of intensifiers do not occur simultaneously but are instead on adjacent half-beats, the analyst may consider them aligned for purposes of determining a point of greatest intensity. If necessary, the analyst may wish to expand this window, but he or she should be careful when doing so.\(^\text{48}\) The larger the window gets, the more difficult it will be to determine where within that window the climax occurs.\(^\text{49}\)

Within each phrase, a single point of greatest intensity is most preferable. This helps simplify one’s conception of the shape of the phrase, keeping it clear for performer and listener alike. In some cases, however, there will be more than one point. This will occur especially when the phrase may be subdivided in some way. (There might be a boundary within a phrase that is

\textit{\textsuperscript{47}} The analyst should apply these guidelines to releases as well: one should prefer the release featuring the most dramatic and smoothest reduction of intensity. 
\textit{\textsuperscript{48}} The author suggests a maximum length of two beats but acknowledges that, while this suggestion is based on his own intuition, it is still somewhat arbitrary. Analysts are welcome and encouraged to select an alternate maximum, if they find it reasonable and practical to do so. 
\textit{\textsuperscript{49}} In the event that one decides to use a brief window for intensifiers, he or she should keep in mind that duplications within a window do not count as multiple intensifiers. Therefore, the maximum number of aligned intensifiers one may have within a window will always be six: one for each intensifier type.
too weak to signify another phrase boundary, but which still indicates a slight break.) Each of the subphrases may then have a climax point of its own, giving the phrase multiple points of greatest intensity.

While one might expect every segment of the music to have an intensity profile that includes a clear peak, this is not always the case. In some instances, a phrase might not have any growth or decay of intensity, creating a period of stasis, which is much more common in twentieth-century music than in traditional tonal music.

The opening of Leslie Bassett’s Music for Alto Saxophone and Piano (fig. 19) helps to illustrate the technique of assigning climaxes. In the first phrase (mm. 1–5) there are considerable alignments of intensifiers at 2.1 (four), 2.5 (five), and 2.8 (four). As one factors in the melodic peaks and buildup and release, the options change. With the addition of these considerations, 2.1 now features six intensifiers (added buildup and melodic peak), 2.4 still features five, 2.5 now features five (added buildup and melodic peak), 2.8 still features four, and 3.4 now features five (added buildup, release, and melodic peak) (fig. 18). The obvious choice for the climax of phrase one is 2.1.

50. For ease of discussion, reference points within the music will be referred to by the measure number followed by a decimal point and the eighth note within that measure. So, for example, the second eighth-note of the third measure would be notated as 3.2. In the case of the first phrase of Bassett’s Music the dynamic intensity is represented by text markings instead of hairpins. This is due to the fact that there is no change in dynamics through the first phrase, and hairpins will contribute no useful representation of dynamic activity in this case. Opening hairpins representing ascending melodic motion are to be counted as intensifiers at each eighth note. However, because it is the high volume and not the actual increase in volume that contributes to intensity, opening hairpins representing crescendos are only counted as intensifiers at the point at which they are loudest. The primary function of dynamic hairpins is to help identify buildups and releases.

51. In this example, because the decision was unequivocal, there was no need to combine adjacent points.
Figure 18. Chart indicating intensifiers in the first phrase of Leslie Bassett’s Music for Alto Saxophone and Piano. In mm. 1–5 arrows indicate potential climax points with intensifier tallies above.

| Melodic Motion | 6 55 45 |
| Shorter Note Durations (S) | 5 5 5 5 |
| Dynamics (f or F) | F F F F F F F F F F F F F F F F F |
| Higher Register (R) | R R R R R R R R R R |
| Increased Density (D) | D D D |
| More Percussive (P) | 4 |

Phrase 1

Figure 19. Opening of Leslie Bassett’s Music for Alto Saxophone and Piano. Brackets indicate phrases, while arrows indicate potential climax points.
Because the other two potential climax points both feature many of the qualities of a true climax and are relatively more intense than the rest of the phrase, the analyst may consider one of them a subclimax. As a general rule, points of relatively greater intensity may be chosen as subclimaxes when they are nearly as intense as the true climax, feature all of the necessary qualities to be one, or both. If such a point is immediately adjacent to a phrase’s peak, it is best to consider it part of the climax, rather than a separate subclimax. Ideally, a subclimax should be separated from the structure’s climax by a minimum of at least one beat.

One may compare 2.4, 2.5, and 3.4 as he or she would potential phrase climaxes to determine which is the better choice as the subclimax of phrase 1. All three of these locations feature five intensifiers. However, 3.4 is preceded by a buildup and followed by a release, while neither 2.4 nor 2.5 has a release, and only 2.5 has a buildup. In spite of the fact that 3.4 has the weakest alignment of intensifiers, it is still the better option for the subclimax since it exhibits all of the qualities of a climax point. It is worthwhile to note that with 3.4 serving as the subclimax, the other points may collectively function as a release from 2.1. The intensifier tallies diminish slightly at each of the alignments through m. 2 (six at 2.1, five at 2.4 and 2.5, and four at 2.8).

As mentioned earlier, the method will not always make choices for the analyst. The value, however, lies in the fact that the method presents viable options from which the analyst may choose and helps the analyst to discover contributing factors that will assist him or her in making an informed decision. Regardless of which climax is chosen, with these techniques the analyst will come to a reasoned conclusion, which will help him or her to play with greater conviction and, as a result, more confidence and will likely develop his or her intuition in the process of coming to that conclusion.
Once the point of greatest intensity has been discerned within a given portion of the piece, it can be represented on the arch map by a peak, preceded by an ascent and followed by a descent, representing the drive to the point of greatest intensity and the retreat from it. Other points of increased intensity for that portion may be represented by peaks that are lower than the climax.  

Returning to Leslie Bassett’s Music for Saxophone and Piano (fig. 19), in the second phrase there are a limited number of locations where intensifiers align (fig. 20). At 6.1 there is an accent combined with shorter note durations and ascending melodic motion. The intensifier tally here is three, but the sudden dynamic drop makes it an undesirable choice as the climax. The other alignment occurs at 7.5 with ascending melodic motion, high dynamics, and an accent, resulting in an intensifier tally of three. As one also factors in buildups and melodic peaks, the tallies change: a buildup precedes 7.5, bringing its total tally to four, and 7.6 also has a count of four. It is the culmination of the melodic ascent, has short note durations and a high dynamic, and it is preceded by a buildup.

Figure 20. Chart indicating intensifiers in the second phrase of Leslie Bassett’s Music for Alto Saxophone and Piano. In mm. 6–7 the arrows indicate potential climax points with intensifier tallies above.

52. Simplistic representations of phrase intensity are acceptable as an analyst starts out, but fine-tuning one’s understandings of slight nuances in intensity and their representation will increase what one gains from using the method. Fluctuations of intensity within a phrase can be very subtle, and understanding and conveying these in performance will contribute to a final product of higher quality.
While both 7.5 and 7.6 have the same intensifier tally, 7.6 is the better option as the phrase climax. Ideally, the material following a climax should act as a release of intensity. It would be counterintuitive to call the material immediately following 7.5 a release: the melodic ascent and the saxophone’s crescendo both continue beyond this point. As a result, it is best for the phrase peak to occur at 7.6. Figure 21 illustrates the graphic representation of the intensity peaks for phrases one and two.

Figure 21. Graphic representation of the first two phrases of Leslie Bassett’s Music for Alto Saxophone and Piano. Intensity peaks are assigned and represented by high points within each phrase.

Theoretically, there are other possible, valid interpretations. One such interpretation involves considering 7.5 and 7.6 aligned, giving phrase two a climax over a brief span, as opposed to a single point. Alternately, phrase two could have two adjacent climaxes, one for each instrument. If the analyst chose either of these interpretations, it would be wise for him or her to note the similarity to phrase one. It too could potentially be interpreted as having a climax over a brief span (2.1–2.5) or separate climaxes for each of the instruments (at 2.1 and 2.5). The analyst should choose the same interpretation for both phrases to help unify them. For the purposes of the analysis presented here, the climaxes will remain as single points at 2.1 and 7.6.

The issue of whether the two instruments present a unified climax or one that is slightly staggered is largely interpretive. One may wish to present the instruments as being relatively independent of one another, in which case having a separate climax for each instrument would be the best option. On the other hand, if the analyst feels that the two instruments are more interconnected and should present themselves as unified, a single climax for the two instruments
would be best. Because the method presented here is directed toward less-experienced interpreters of music, the analyst is advised to assign unified climaxes. Doing so will scale back the complexity of the method to some degree, and it will also help the performers present a clearer interpretation. (Divergent climaxes among instruments have the potential to muddy phrase shapes.)

When all of the segments at the level of the phrase have been assigned a shape, the analyst may then move to the next hierarchical level, assigning shapes to the phrase groups. Similar to assigning peaks to phrases, there will be a number of peaks within a phrase group, but it is preferable to have only one primary peak. To determine how the phrase group should be shaped, the analyst looks at the high points of intensity among all of the phrases included in the group. The one that is most intense and features the strongest buildup and release of intensity can be considered the climax for the entire group and is notated on the intensity map accordingly. To show this, the analyst should make this peak the highest of all in the group.

Comparing the climax points of phrases one and two of Bassett’s Music, one will notice that the two phrases have comparably strong climaxes. The first phrase features a substantial climax with six intensifiers and a somewhat strong buildup and release. Both the buildup and the release are primarily indicated by the melodic motion. (An overall decrease of intensifiers also contributes to the release.) In terms of the melodic motion, the buildup spans fourteen semitones, while the release spans thirty semitones. Comparatively, the second phrase’s climax has fewer intensifiers (four), and it does not feature a release, but its buildup is much stronger: the dynamics go from mezzo piano to fortissimo, and the melody rises thirty semitones. While the second phrase’s buildup is significantly stronger, it lacks a release, and its alignment of
intensifiers is weaker. Thus, the first phrase has a more intense climax point than the second, indicated on the graphic by the peak’s superior height in figure 22.

![Graphic representation of the first phrase group of Leslie Bassett’s Music for Alto Saxophone and Piano. As indicated by its superior peak, the most intense point of the group is the first phrase’s climax.](image)

Figure 22. Graphic representation of the first phrase group of Leslie Bassett’s Music for Alto Saxophone and Piano. As indicated by its superior peak, the most intense point of the group is the first phrase’s climax.

To finish the intensity map, the process of assigning climaxes is continued at each hierarchical level: Within each subsection all of the phrase-group climaxes are considered and the most intense one is raised above the others, within each section all of the subsection climaxes are considered, etc. This continues until a single primary climax point is assigned to the entire composition. The result is a graphic representation of the structure of the entire piece of music including climaxes at all hierarchical levels (see appendix C).

The assignment of larger structural climaxes within a piece will not affect the note-to-note performance of a work as much as it will affect the performer’s conception. Knowing where larger structural climaxes occur can help the performer to understand more clearly the pacing of a work necessary to allow it to unfold logically and in a musically reasonable fashion.

As performers go through the process of creating an intensity map, it is important that they test the results of their findings. After an analytical decision has been made, the result of the decision should be performed on the instrument to see if it really works. One finding may make some sense when it is justified on paper, but when it is performed it may be musically dissatisfying. By hearing the performance of that finding, one can decide whether or not that is what makes the most sense. In this respect, the method helps to provide a consciously directed framework in which the performer may test out different interpretations. This is a symbiotic
process in which the performer/analyst relies on intuition to guide analytical decisions and relies on analytical decisions to provide information to intuition.

When finished, the results of the intensity map are transferred to performance. To realize the fluctuations of intensity represented on the map, the performer can increase and decrease the volume and adjust the width and speed of the vibrato as necessary. Tone color manipulation can also help to bring out the intensity shapes. It is important to note that as one realizes an interpretation, in addition to adding to the intensity, he or she will also lessen it at times. The performer should experiment with these different aspects of the music in order to find a combination that will best suit the shape and character of the structure.

Advantages and Benefits

The processes of segmentation, grouping, and graphic representation illustrated above are not necessarily a cure-all for the performer. They will not tell performers exactly how to perform a piece of music. Instead, these techniques will help them develop a viable interpretation and increase their comprehension of how the piece is put together, aiding them in identifying the shapes of all of the constituent parts of the piece, so that they may better convey those musical shapes to the audience.

This process of parsing the music and identifying the points of intensity is beneficial for a number of reasons. First, it is a process that, in a very systematic manner, allows the performer to determine the structure of the piece on several hierarchical levels. Dividing the composition in this manner helps performers make better sense of how the piece is put together, which will ultimately make their interpretations much more understandable to an audience. If they are not sure where phrases begin and end, the performance could very likely be an aimless wandering through the composition, leaving the audience confused and even bored. In twentieth-century
music there are no longer the conventions and musical norms that are present in traditional tonal music. Therefore it is of utmost importance that the performer be as clear and as explicit with the performance as possible, so that the maximum amount of efficient communication may occur. Understanding the organization of the piece is integral to this process.

Second, analyzing the shapes of the various structures within the music is of even greater importance than simply discovering their beginnings and ends. Seeing only an outline of an object gives a vague indication of what it looks like, but seeing all of its features will give one a more complete concept of the object’s true appearance. This is especially important for performers, who need to know not only where structures begin and end but must also decide how to shape them and all of their constituent parts.

Another advantage to this method is its comprehensiveness: it ensures that the entire composition will be accounted for both linearly and hierarchically. Using the method, an analyst should be able to analyze every portion of a piece and, on some level, account for every musical gesture. If performers simply go through a piece and decide how each phrase is to be performed, it is quite possible that they will miss musical structures that are hierarchically below or above the level of the phrase. While the surface level of structure in a composition is important, the other hierarchical levels of a piece can be just as (if not more) important to the development of an interpretation of the composition. A hierarchically sound interpretation will also be more coherent. By understanding how phrases relate to one another within a larger context, a performer can present them as related instead of as a string of independent, unconnected segments.

This process is also beneficial in that it creates a musical notation that is one step closer to its end product. Traditional music notation is relatively abstract: It is simply a series of dots,
lines, and letters. It takes a great deal of energy and concentration to convert those symbols into aural gestures. Furthermore, music notation is primarily concerned with surface details and does little to represent hierarchical organization or intensity. The method described here creates a stepping stone from abstract symbolism to aural gesture, accounting for grouping and climax. It is a graphic gesture that can be musically realized more easily and immediately.

The intensity map can also serve archival purposes. If the performer creates this representation and returns to the piece much later, this will be available to use to recall the original interpretation of the piece. It will take far less time to relearn the work than it would relying on raw memory alone.

Conclusion

While the absence of any compositional conventions and interpretive traditions in contemporary music presents difficulties for many performers, the method proposed, described, and illustrated here is a means of overcoming these difficulties. Using this method, it should be possible to attain a greater understanding of the form, shape, and growth and decline of intensity of a range of modern musical compositions. The techniques illustrated in this chapter give the analyst the tools needed to systematically segment the music, represent this segmentation graphically, determine the intensity at several hierarchical levels of the piece, and graphically represent the intensity shape of the piece. As proposed at the outset of this chapter, the techniques herein work in tandem with intuition to provide the performer/analyst with a viable interpretation that is logical, unique, and justifiable.
CHAPTER 4: APPLICATION OF THE METHOD TO THE DIVERTIMENTO FOR ALTO SAXOPHONE AND PIANO BY CHARLES WUORINEN

Introduction

The Divertimento for Alto Saxophone and Piano by Charles Wuorinen was commissioned by and written for saxophonist Christopher Ford in 1982. It is a single-movement work consisting of three sections, it is atonal and metrically irregular, and it features some extended techniques for both performers (stopped piano, flutter-tonguing). Due to its nontonal harmonic language and nontraditional phrase structure, it is an excellent piece for use in the demonstration of the method proposed in chapter 3.

Segmentation

The first step in the method is to tally the parametric changes using the default minimums and increments proposed in chapter 3. After doing so, the analyst should integrate these changes with one another and organize them by the numbers of occurrences, which, in the case of Wuorinen’s Divertimento, are as follows:

<table>
<thead>
<tr>
<th>Parametric Change</th>
<th>Number of Occurrences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tempo change of 50%</td>
<td>1</td>
</tr>
<tr>
<td>Tempo change of 30% and greater</td>
<td>2</td>
</tr>
<tr>
<td>Five levels of dynamic change and greater</td>
<td>4</td>
</tr>
<tr>
<td>Rest, two beats and longer</td>
<td>5</td>
</tr>
<tr>
<td>Saxophone register change of 25 semitones and larger</td>
<td>6</td>
</tr>
<tr>
<td>Rest, one and a half beats and longer</td>
<td>7</td>
</tr>
<tr>
<td>Timbre</td>
<td>8</td>
</tr>
<tr>
<td>Saxophone register change of 23 semitones and larger</td>
<td>8</td>
</tr>
<tr>
<td>Saxophone register change of 21 semitones and larger</td>
<td>9</td>
</tr>
<tr>
<td>Four levels of dynamic change and greater</td>
<td>10</td>
</tr>
<tr>
<td>Saxophone register change of 19 semitones and larger</td>
<td>12</td>
</tr>
<tr>
<td>Saxophone register change of 17 semitones and larger</td>
<td>15</td>
</tr>
<tr>
<td>Rest, one beat and longer</td>
<td>16</td>
</tr>
<tr>
<td>Three levels of dynamic change and greater</td>
<td>18</td>
</tr>
<tr>
<td>Rest, three quarters of a beat and longer</td>
<td>18</td>
</tr>
<tr>
<td>Two levels of dynamic change and greater</td>
<td>23</td>
</tr>
<tr>
<td>Rest, half a beat and longer</td>
<td>24</td>
</tr>
<tr>
<td>Saxophone register change of 15 semitones and larger</td>
<td>25</td>
</tr>
</tbody>
</table>
Rest, one quarter of a beat and longer 26
All rests 27
Saxophone register change of 13 semitones and larger 42
Saxophone register change of 11 semitones and larger 68
One level of dynamic change and greater 85
Saxophone register change of 9 semitones and larger 86
Instrumentation 89
Saxophone register change of 7 semitones and larger 107

After compiling the combined tally, the analyst should determine which parameters are (a) highly significant, (b) moderately significant, and (c) insignificant by looking for gaps. The first three major gaps in numbers of occurrences appear after all rests, saxophone register changes of 13 semitones and larger, and saxophone register changes of 11 semitones and larger. Two of these gaps must be chosen as dividing points defining highly significant, moderately significant, and insignificant changes. Any choice from these three will create a distribution that will suffice due to the inclusion of dynamic changes, rest versus sound changes, and saxophone register changes in the “highly significant” column. (In this analysis, these are all of the parameters in which there are multiple levels of change.) For the purposes of this analysis, the combined tally will be split after rests less than one quarter of a beat and longer and after saxophone register changes of 11 semitones and larger. This division ensures that dynamic changes, rests, saxophone register changes, and tempo changes (all of the types of change with multiple levels) are each represented in the Highly Significant group. The result is:

<table>
<thead>
<tr>
<th>Highly Significant</th>
<th>Moderately Significant</th>
<th>Insignificant</th>
</tr>
</thead>
<tbody>
<tr>
<td>All tempo changes</td>
<td>Saxophone register change of 11 to 14 semitones</td>
<td>One level of dynamic change</td>
</tr>
<tr>
<td>All timbre changes</td>
<td></td>
<td>Instrumentation</td>
</tr>
<tr>
<td>Two levels of dynamic change and greater</td>
<td></td>
<td>Saxophone register change of 7 to 10 semitones</td>
</tr>
<tr>
<td>All rests</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
With this information, the analyst may begin segmenting the Divertimento. (For the complete results of the segmentation, see the form chart in appendix A.)

The analyst should start by delineating the first four to six phrases to be used in determining a phrase-length average. Highly significant changes will indicate likely phrase boundaries, and such changes in the opening of the Divertimento create the segments:

<table>
<thead>
<tr>
<th>Segment</th>
<th>Length in Seconds</th>
<th>Change indicating end of segment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1–3.1</td>
<td>7.5</td>
<td>One-beat rest</td>
</tr>
<tr>
<td>3.2–4.4</td>
<td>6.94</td>
<td>One and one-quarter beat rest</td>
</tr>
<tr>
<td>4.4–4.6</td>
<td>2.06</td>
<td>Three-level dynamic change (piano to forte)</td>
</tr>
<tr>
<td>5.1–6.4</td>
<td>4.69</td>
<td>Four-level dynamic change (forte to pianissimo), timbre change</td>
</tr>
<tr>
<td>6.4–9.3</td>
<td>11.81</td>
<td>16-semitone saxophone register change</td>
</tr>
<tr>
<td>9.4–10.1</td>
<td>4.5</td>
<td>One-beat rest and four-level dynamic change</td>
</tr>
<tr>
<td>10.2–14.1</td>
<td>25.5</td>
<td>One-beat rest</td>
</tr>
<tr>
<td>14.2–14.7</td>
<td>4.5</td>
<td>Timbre change</td>
</tr>
<tr>
<td>15.1–16.1</td>
<td>2.63</td>
<td>Two-level dynamic change (piano to mezzo forte)</td>
</tr>
<tr>
<td>16.1–17.3</td>
<td>4.5</td>
<td>Timbre change</td>
</tr>
<tr>
<td>17.3–22.1</td>
<td>15.38</td>
<td>19-semitone saxophone register change</td>
</tr>
</tbody>
</table>

One may notice that there are two timbre changes (at 4.6 and 5.1) that were not taken into consideration for this initial segmentation. While timbre changes are considered highly significant, the close proximity of these changes reduces their importance a great deal. These two changes (more than ten percent of the total) are within one second of one another (which is obviously less than the five-second limit proposed in chapter 3). This local saturation demotes these timbre changes, and, as a result, they do not indicate boundaries.

As mentioned in chapter 3, the phrase-length limits are 5 and 37 seconds, but most phrases should preferably fall between 10 and 30 seconds. This guideline draws attention to several segments that the analyst may consider combining with adjacent material. The first two (1.1–3.1 and 3.2–4.4) are both long enough for the extreme limit, but it is preferable to join them with neighboring material, and the motivic similarity suggests that doing so is a good option. The
second segment is nearly an exact repetition of the first: such a high level of similarity strongly promotes unifying these segments.

The third and fourth segments (4.4–4.6 and 5.1–6.4) are also relatively short, and linking them with neighboring segments is a viable option. There are several ways of doing so. One must take strength of boundaries, similarity, and parallelism into consideration to determine which option is best. (See appendix D for the summary of a motive and pitch analysis of the Divertimento.)

One may first decide what to do with 4.4–4.6. It may be combined with 1.1–4.4 or 5.1–6.4. The boundaries at 4.4 and 5.1 both feature highly significant changes, but neither can be definitively be chosen as the strongest.¹ Thus, the analyst must look to parallelism and similarity. The only parallelism existing at this point is within 1.1–4.4; adding material to this segment would disrupt its internal parallelism. This suggests that it would be unwise to join 4.4–4.6 with this segment. In terms of similarity, the pitch material in 4.4–4.6 is somewhat related to the material in 1.1–4.4 (both feature A3 and B3 rather prominently). However, 4.4–4.6 is much more similar to 5.1–6.4: both feature pitches G#3, A3, A#3 (or Bb3), and B3, and both include stopped piano as part of the instrumentation. These factors indicate that uniting 4.4–4.6 and 5.1–6.4 is the best option, the result of which is a single segment (4.4–6.4) that is 6.75 seconds long.

While the method does not require any further action regarding this newly created segment (4.4–6.4), it would be preferable to combine it with adjacent material due to its short duration. When comparing the boundaries, 6.4 stands out as the strongest due to its near-

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¹ As mentioned in chapter 3, when comparing changes across parameters within the same level of significance, for one type of change to be considered stronger than the other, it must occur less than half as frequently. Therefore, in this case dynamic changes of three levels and greater would have to occur thirteen times or less to be considered stronger than rests one quarter of a beat and longer, which occur twenty-six times in the Divertimento.
alignment of a four-level dynamic change and a timbre change, suggesting that 4.4–6.4 should be added to 1.1–4.4. However, doing so would disrupt the first phrase’s internal parallelism. Additionally, there is strong similarity between 4.4–6.4 and 6.4–9.3: the prominent pitches G#3, A3, A#3/Bb3, and B3 in 5.1 to the beginning of 6.4 are also featured from the latter portion of beat 6.4 through 7.6, suggesting that these two segments should be combined. While the boundary at 6.4 is relatively strong, both parallelism and similarity indicate that the analyst should indeed join 4.4–6.4 with 6.4–9.3. The resulting segment spans from 4.4 to 9.3 and is 18.56 seconds long.

The next segment, 9.4–10.1, is too short. Unfortunately, no parallelism exists to provide direction in deciding how to combine the fragment, but the similarity between this segment and its neighbors can be helpful. The register of the saxophone in 9.4–10.1 and in 10.2–14.1 is very comparable, especially for the first half of 10.2–14.1. On the other hand, the rhythmic activity in 9.4–10.1 is hardly matched in 10.2–14.1, while there is a fair amount of equivalent activity in 4.4–9.3 (especially at 4.4, 6.2, 6.4, 7.1, and 9.3). Furthermore, the rhythmic activity in 9.4–10.1 is essentially a continuation of a gesture begun by the piano in 9.3. The pedaling in the piano also links 8.6 through 9.8, discouraging a boundary at the end of 9.3. When one compares the boundaries at 9.3 and 10.1, it immediately becomes obvious that 9.4–10.1 should be combined with 4.4–9.3: 9.3 features only one highly significant change (a saxophone register change of 16 semitones), while 10.1 features two (a one-beat rest and a four-level dynamic change). The result is a segment spanning from 4.4 to 10.1 that is 23.06 seconds long.

The next segment, 10.2–14.1 is of adequate length (25.5 seconds), but the three following it are not. In terms of pitch material, these segments are relatively similar and could all be combined together to form an 11.63-second unit. However, the first of these three segments
(14.2–14.7) is nearly identical to the material at 1.1–3.1 and 3.2–4.4, and the last segment (16.1–17.3) is very similar to 4.4–5.3, especially in the piano part. This suggests that, to promote the parallelism between these passages, the best solution is to segment 14.2–17.3 in a similar fashion to 3.2–5.3. This involves combining 14.2–14.7 with 15.1–16.1, creating a segment that is 7.13 seconds long.

It is worthwhile to note that while this segment is of adequate length, it is shorter than the preferred segment-length minimum (10 seconds). One would ordinarily consider looking for a way to fuse this segment with one next to it, but this is a special situation in that 14.2–16.1 is an abbreviated representation of a longer segment (1.1–4.4). As a result of this relationship, appending adjacent material to 14.2–16.1 is not necessary.

As mentioned previously, the remaining segment from this passage, 16.1–17.3, is too short to stand alone. Neither boundary strength nor similarity is much help. Due to the parallelism between 1.1–5.3 and 14.2–17.3, it is clear that 16.1–17.3 should not be combined with 14.2–16.1 (as 4.4–5.3 is not combined with 1.1–4.4). The only remaining option is combining 16.1–17.3 with the segment that follows it, 17.3–22.1. The resulting segment is 19.88 seconds long.

To this point, five segments of acceptable length have been delineated in the initial segmentation. As mentioned in chapter 3, the analyst should use the first four to six segments to determine a phrase-length average. For the purposes of this analysis, the first five segments will be used:

<table>
<thead>
<tr>
<th>Segment</th>
<th>Length in Seconds</th>
<th>Change indicating end of segment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1–4.4</td>
<td>14.44</td>
<td>One quarter-beat rest</td>
</tr>
<tr>
<td>4.4–10.1</td>
<td>23.06</td>
<td>One-beat rest and four-level dynamic change</td>
</tr>
<tr>
<td>10.2–14.1</td>
<td>25.5</td>
<td>One-beat rest</td>
</tr>
<tr>
<td>14.2–16.1</td>
<td>7.13</td>
<td>Two-level dynamic change (piano to mezzo forte)</td>
</tr>
<tr>
<td>16.1–22.1</td>
<td>19.88</td>
<td>19-semitone saxophone register change</td>
</tr>
</tbody>
</table>
The average length of these segments is 18.00 seconds. This creates a phrase-length window mandating that all phrases must be at least 9 seconds long and no more than 36 seconds. However, the preference guideline of 60% to 180% suggests that phrases should preferably be between 10.8 and 32.4 seconds in length.

Resuming from 22.2, the analyst will use the phrase-length window to determine where phrase boundaries occur. For the first phrase beyond this point the window begins at 24.3 and ends at 30.3 (fig. 23). As the chart indicates, there are two viable locations for the boundary: 26.2, and the short span from the end of 29.1 to 30.2. Of these, the best is obviously the brief span: it features four highly-significant changes as opposed to the single highly-significant change at 26.2.

Figure 23. Chart indicating parametric changes in mm. 24–30 of the Divertimento.  

2. Due to an error in the score, there are two measures between mm. 26 and 28. These measures will be referred to as 27a and 27b to avoid confusion. (Such an error also occurs between mm. 98 and 100, resulting in mm. 99a and 99b.  
3. While the brief span here appears to include more than four beats (the recommended maximum), it does not. Because rests are counted at the end of their durations, the span may begin half a beat before 29.2 and end half a beat after the beginning of 30.2, which includes the saxophone register change. Between each of these half beats there are three beats (29.2, 29.3, and 30.1) bringing the total number of beats to four.  
4. As in all of the segmentation charts in this chapter, capital letters indicate highly significant parametric changes, while lower-case, italicized letters indicate moderately significant
As mentioned in chapter 3, when one considers brief spans of time to identify boundaries, he or she must specify at what point within that span the boundary should be imposed. In the case of this span (the end of 29.1 to 30.2), there are three candidates: the end of 29.1 (due to the rest), 30.1 (due to the timbre change and the dynamic change), and 30.2 (due to the saxophone’s register change). The primary factor to consider in this case is similarity. The pitch material indicates that the end of 29.1 is most likely the best candidate. Pitch classes 1, 6, and 9 account for three-fourths of the pitches at any given point between 29.1 and 30.2 (and pitch-class 9 appears nearly constantly to 30.5), serving as a bond that holds this material together. It would be best to keep it unified, and the best way to do so is to set the boundary at the end of 29.1, resulting in a 32.63-second phrase.

Because this phrase is longer than the preferred maximum (32.4 seconds) the analyst is invited to look for a place at which to split the phrase. The optimal location would be where there is a boundary indicated by a highly-significant change. The only option is the saxophone register jump of 16 semitones at 26.2. This would break the phrase into two phrases of adequate lengths, but the similarity on both sides of that point tie the material together, discouraging one from separating it: long, high register notes (primarily G#5s and F#5s) pervade the saxophone part from 24.1 to 28.4. Unfortunately, there is also no relevant parallelism in this section to support a decision one way or another. Because no option stands out as best, the phrase may remain as it is.

The next phrase-length window begins at 31.5 and ends at 38.6, during which there are four highly significant changes (fig. 24). The rest at 33.1 coincides with the four-level dynamic change at 33.2, due to the fact that rests are counted where they end. Standing alone, neither the parametric changes. Insignificant changes are not represented. Brackets above the charts indicate the phrase-length window.
timbre change at 31.5 nor the rest at 32.1 is a better option as a boundary than the two highly-significant changes at 33.2. Even if one considers 31.5–32.1 as a brief span and combines the two changes, 33.2 would still be the better option due to the more precise alignment of its changes. As a result, the boundary is 33.2, ending a phrase that spans from 30.1 to 33.1. It is 12.00 seconds long.

Figure 24. Chart indicating parametric changes in mm. 31–38 of the Divertimento.

The phrase begun at 33.2 has the possibility of ending somewhere between 36.1 and 41.1. As figure 25 indicates, there are few highly significant changes within this span. In fact, there is only one: a two-beat rest at 40.1–40.2. The rest clearly serves as the end for this phrase, which is 30.75 seconds long and extends from 33.2 to 40.2.

Figure 25. Chart indicating parametric changes in mm. 36–41 of the Divertimento.
Using the initial segmentation techniques and the phrase-length window, there have been eight phrases delineated thus far:

<table>
<thead>
<tr>
<th>Segment</th>
<th>Length in Seconds</th>
<th>Change indicating end of segment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1–4.4</td>
<td>14.44</td>
<td>One quarter-beat rest</td>
</tr>
<tr>
<td>4.4–10.1</td>
<td>23.06</td>
<td>One-beat rest and four-level dynamic change (forte to pianissimo)</td>
</tr>
<tr>
<td>10.2–14.1</td>
<td>25.5</td>
<td>One-beat rest</td>
</tr>
<tr>
<td>14.2–16.1</td>
<td>7.13</td>
<td>Two-level dynamic change (piano to mezzo forte)</td>
</tr>
<tr>
<td>16.1–22.1</td>
<td>19.88</td>
<td>19-semitone saxophone register change</td>
</tr>
<tr>
<td>22.2–29.1</td>
<td>32.63</td>
<td>Timbre change, two-level dynamic change, one-beat rest, and 21-semitone saxophone register change</td>
</tr>
<tr>
<td>29.2–33.1</td>
<td>12</td>
<td>Four-level dynamic change and one-beat rest</td>
</tr>
<tr>
<td>33.2–40.2</td>
<td>30.75</td>
<td>Two-beat rest</td>
</tr>
</tbody>
</table>

The analyst may continue segmenting the Divertimento in this manner until all of the phrases within the work have been identified. As advised in chapter 3, it is wise for the analyst to reexamine and revise continually through the piece. In this light, after determining the boundaries of several more of the phrases, the analyst may wish to calculate a new phrase-length average based on the existing phrases and reapply the phrase-length window.

Phrase Grouping

The next step of the analysis is grouping the phrases together. (For a graphic representation of the grouping, see appendix B.) As mentioned in chapter 3, the analyst may consider strength of boundaries, similarity of musical material, and parallelism to determine which phrases should be grouped together to form phrase groups.

Returning to the beginning of the Divertimento, when one compares the boundaries at 4.4 and 10.1, it is fairly clear that the second of these is stronger: a beat-long rest paired with a four-level dynamic change is obviously far more significant than a quarter-beat rest. There is also a strong pitch similarity between phrases one (1.1–4.4) and two (4.4–10.1), helping to tie them together: phrase one consists only of A3 and B3, and phrase two features these two pitches quite
prominently, especially throughout the first half of the phrase. As a result, the opening phrase (1.1–4.4) groups with the second phrase (4.4–10.1).

The second phrase also groups with the third phrase (10.2–14.1). This is due to the return of the opening motive (A3 to B3) at 14.2. Because this motive was presented at the beginning of a phrase group at the opening of the piece, it should function in the same manner at 14.2. The result is that phrase three (10.2–14.1) cannot be grouped with phrase four (14.2–16.1), meaning it must either stand alone or join the first two phrases. While either of these options would be acceptable, the registral similarity between the end of phrase two and the beginning of phrase three suggests that they would group together well. The first phrase group therefore extends from 1.1 to 14.1.

Phrase four (14.2–16.1) groups well with phrase five (16.1–22.1) for a number of reasons. Most notably, there is a strong similarity between phrase four and the beginning of phrase five in terms of pitch content and timbre. Measures 16 and 17 feature A3 and B3 almost exclusively in the piano part, linking them to the A3–B3 motive in the saxophone part in phrase four. Additionally, the stopped piano through these measures serves as a unifying factor. One may also consider the parallelism created by the A3–B3 motive: because phrase one was grouped with phrase two, one should group phrase four with phrase five.

As one examines the boundaries of phrase six (22.2–29.1), it quickly becomes apparent that it groups best with the preceding phrases. The boundary at 22.2 is far weaker than the one at 29.1–30.2: the former features only one highly significant change, while the latter includes four. Also contributing to the conclusion is the fact that the melodic material in mm. 19–21 predominantly features leaps of 11 semitones, which are echoed at the beginning of phrase six when the saxophone leaps down 11 semitones from Ab5 to A4 in m. 23. There are also semitone
grace notes in mm. 17, 21, and 24. These relationships contribute to the cohesion between phrases five and six which combine to form the end of the second phrase group. This group therefore spans from 14.2 to 29.1.

Moving forward, one will notice that there is no relevant similarity or parallelism between phrases seven (29.2–33.1) and eight (33.2–40.2). Boundary strength therefore serves as the best indicator of how to group these phrases. The boundary separating them is relatively strong, as it features two highly significant changes (a four-level dynamic change and a beat-long rest). However, the boundary at 40.1–40.2 (a two-beat rest) is also rather strong: It is the longest rest in the piece thus far. In fact, all of the rests prior to this have been one beat or shorter. These factors indicate that the boundaries are comparable, which means that neither is necessarily the better option as a phrase-group boundary. As a result, the analyst may simply choose one. This analysis will group phrases seven and eight together into phrase group three, which spans from 29.2 to 40.2.5

As illustrated with phrase groups 1 and 2, one may use parallelism to help determine how he or she should group phrases together. However, this also applies to nonadjacent material. Measures 14–66 are clearly related to mm. 83–135 by T8 transposition and a number of rhythmic and motivic similarities (see appendix D). As a result of this relationship, the material within these passages should be grouped in a similar fashion. So, because there is a phrase-group division at m. 14, it is likely that there is also one at m. 83. These motivic and pitch relationships

5. This configuration creates a phrase group that is relatively close to the length of other phrase groups. If phrase seven stood alone as a phrase group, it would be significantly shorter than other phrase groups. As mentioned in chapter 3, one factor that helps to identify formal units is their length. Therefore, it is beneficial to strive for consistency of length among formal units.
exist at a number of places within the Divertimento, and in many cases the grouping structure of the piece reflects this.

Just as phrases can be combined into larger structures, phrase groups may be amalgamated to form subsections. For example, it is clear that one should combine the first two phrase groups to form a subsection. They are parallel to one another, as they both begin with the same motive and they also share several similarities. As one compares boundaries, the boundary at 14.1 is obviously weaker than the one at 29.1. The latter features four highly significant changes (fig. 23). The multitude of these changes carries more weight than those at 14.1 (a one-beat rest and an eleven-semitone saxophone register change). While the boundary at 29.1 is weakened by the wide disbursement of its changes, its alignment of the timbre change and the dynamic change alone make it stronger than the boundary at 14.1. The first subsection therefore ends at 29.1.

The third phrase group (29.2–40.2) ends with a relatively strong boundary. It is strong especially in comparison to the next phrase-group boundary (at 47.1) which is exemplified only by a 19-semitone saxophone register change. Rests two beats and longer occur less than half as often as 19-semitone saxophone register changes, making them notably stronger. This relatively strong boundary suggests that the third phrase group might stand alone at the level of the subsection. The lack of any parallelism or similarity between this group and the subsequent group further supports this notion. As a result, this phrase group will not be combined into a subsection but will be included with adjacent material at the next hierarchical level.

After continuing up the hierarchical ladder in this fashion, one is eventually left with only four large sections that group together to form the entire piece. All of these phrase, phrase-group,
subsection, and section boundaries are shown on the form chart and arch map (see appendices A and B).

**Intensity Map**

When the structures within the composition have been delineated and represented on the form chart and arch map, the analyst may begin determining the shapes of these structures. By finding points of relatively higher intensity within each formal unit, one can create an intensity map. (For a complete intensity map, see appendix C.) As mentioned in chapter 3, all of the aspects of music that create greater intensity are relative. These aspects will be evaluated within their context: When one is determining the climax point of a phrase, the intensifiers will only be judged against other intensifiers within that phrase.

Like most other twentieth-century compositions, determining phrase shapes in the Divertimento can be rather simple at times, while at other times it can be very difficult. The first several phrases illustrate this.

Phrase 1 (1.1–4.4) consists of two nearly identical figures, creating a phrase shape that includes two identical peaks. The indicators of intensity within these first two figures are relatively sparse (fig. 26). The brief moments of ascending melodic motion (the motion from A3 to B3) are both too short in terms of time and too small in terms of interval to have any influence on the intensity of the phrase. The only aspects that truly contribute to the shape of the phrase are the dynamic change and the accents. The crescendos and decrescendos create clear buildups and releases of intensity, while the dynamic accents indicate the most intense points within the phrase. The two figures are nearly identical, except for one detail affecting the intensity: The first figure is marked pochissimo fortepiano, and the second is simply marked fortepiano. This
indicates that the first fortepiano is slightly less intense than the second. Consequently, 4.1
should be the climax, and 2.1 should be a subclimax (see appendix C, mm. 1–4).

Because it is longer and contains a wider range of musical material than the first phrase,
the analyst must take more into consideration when determining the shape of the second phrase
(4.4–10.1, fig. 27). There are several locations in this phrase that one can consider more intense
due to an alignment of intensifiers: 5.2 (higher dynamics, an increase in harmonic density, and an
accent), 8.6 (higher dynamics, an increase in harmonic density, and an accent), 9.3 (shorter note
durations, relatively high dynamics, and an increase in harmonic density), and 9.4, 9.5, and 9.6
(all featuring ascending melodic motion, shorter note durations, and higher register). When one
also includes the buildups and releases in deciding which locations are strongest, the best options
for the phrase climax are 5.2, 8.6, and 9.3. The final tallies for these points are 5, 4, and 4
respectively, suggesting that 5.2 is the climax. However, while 5.2 may outnumber 8.6 and 9.3 in
terms of quantity, its buildup and release are inferior in terms of quality. Change in volume alone
comprises the buildup and release for 5.2. On the other hand, the buildup to 8.6 features an

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6. For the purposes of this analysis, the following types of intensifiers will be represented on the
intensity charts: (1) Melodic motion: in the primary melodic voice, ascending or descending
leaps of more than four semitones, or multiple steps in the same direction spanning a distance
greater than four semitones; (2) Note durations: two or more durations shorter than 16th notes; (3)
Dynamics: crescendos and decrescendos indicated by hairpins or text dynamic markings; (4)
Register: for the saxophone, any pitches above concert G#4; for the piano, any pitches above
concert G5; (5) Harmonic density: additions of any voice to the texture; (6) Percussiveness: any
accents. It is important to note that the types of intensifiers used to determine climax points will
be different from one piece to another.
increase in volume paired with a growing number of intensifiers. Likewise, the release from 9.3 is exemplified by both volume and diminishing intensifiers. If one treats 8.6–9.3 as a brief span capable of serving as the climax for phrase two, it outweighs 5.2 as the best choice. This span features four distinct intensifiers, and it is preceded by a buildup and followed by a release, bringing its total intensifier count to six. As a result of these factors, 8.6–9.3 is the best option for the climax for phrase two (see appendix C, mm. 4–10).

Like phrase two, the third phrase of the piece (10.2–14.1, fig. 28) lacks an obvious climax, so the techniques for finding the best option are again very useful. There are three viable locations for the climax: 11.3 (high register with a buildup and release), 11.9 (alignment of shorter note durations, higher register, and increased density), and 12.4 (alignment of increased density and greater percussiveness preceded by a buildup and followed by a release). As one considers the multiple factors involved, it becomes evident that none of these three options prominently stands out as the best choice. The intensifier counts at 11.3 and 11.9 are three, while at 12.4 it is four. However, the buildup to and release from 12.4 (exemplified by small dynamic changes) are weakened by the opposing melodic motion. Of the other possibilities, 11.9 is an undesirable choice due to its lack of buildup or release, and the absence of an alignment of intensifiers at 11.3 reduces its quality as a climax. In spite of the fact that the buildup and release for 12.4 are weakened, they are still present in conjunction with an alignment of intensifiers.
Therefore, this location is the best option and should be considered the climax of phrase three (see appendix C, mm. 10–14.1).

![Figure 28. Chart indicating intensifiers in mm. 10–14.1 of the Divertimento.](image)

Once the intensity shapes of the phrases have been represented, the analyst may move to a higher level of hierarchy and determine the intensity shape of larger structures. To determine how a phrase group should be shaped, one looks at the high points of intensity among all of the phrases included in the group. The one that is most intense and features the strongest buildup and release can be considered the climax for the entire group.

Taking the first group (1.1–14.1) into consideration, one can compare the phrase climaxes at 4.1, 8.6–9.3, and 12.4. The first is relatively weak in terms of intensity: It features low dynamics and little else. The peak at 12.4 is slightly more intense due to more intensifiers, but the peak at 8.6–9.3 is the most intense. It features the strongest buildup and release of intensity in the group. The buildup is most prominently realized in the dynamics, which expand from pianissimo at 7.6 to fortissimo at 8.6. The release is realized in the dynamics as well (fortissimo at 8.6–9.2, decreasing to mezzo forte at 9.5), but also in the alignment of intensifiers, which decrease from 9.3 through 9.8 by proceeding 3, 2, 2, 2, 1. Additionally, the climax of phrase two possesses some of the most rhythmically active and loudest material. These factors

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7. When determining phrase-group climaxes, the analyst should still consult the charts used for phrase climaxes. One can compare them to one another to find the best option for the group climax.
give it the greatest hierarchical importance. When represented on the intensity map, its peak should be the highest among all of the peaks within the phrase group.

Continuing in this manner will yield an intensity map for the entire work (appendix C), representing the shape of the structures at each of the hierarchical levels. Each phrase, phrase group, subsection, and section will have a single highest peak, indicating the climax of each structure. This will give the performer a clearer conception of the growth and recession of intensity within a piece at several levels, helping the performer/analyst to create a more logical, interesting musical interpretation for performance.

Realizing this interpretation is the final task of the performance analysis. One may use the knowledge of where structures begin and end and how they are shaped to make decisions about vibrato, tone color, rubato, and dynamic shadings. Generally, to help heighten a climax and clearly portray the phrase’s shape, one may wish to increase the speed and perhaps the width of the vibrato as he or she nears the climax, and do the opposite as the intensity decreases. In some contexts, a brighter tone color helps to highlight a climax, and increasing the tempo slightly will further add to the energy. However, the performer is advised to experiment with all of these variables and choose a combination of manipulations that most tastefully accommodates the music.
CHAPTER 5

Conclusion

The method illustrated in chapter 4 and described in chapter 3 provides a performer/analyst with a means of segmenting and hierarchically organizing an entire twentieth-century composition using a variety of the parameters within the music. The results of this analysis can be represented in two different representational forms: a form chart and an arch map. Additional information in the music can subsequently be taken into consideration to help the performer decide how to shape each of the phrases, phrase groups, subsections, sections, and finally, the entire piece. The results of this analysis may then be graphically represented in the form of an intensity map. These products and the steps taken to create them will help a performer to understand how a composition fits together hierarchically and how the different structures within that hierarchy may be shaped in performance.

Suggestions for Further Research

While this method of performance analysis is intended for twentieth-century music in general, it could conceivably be expanded and modified to be more directly applicable to specific musical styles within the twentieth-century, yielding more precise results for those styles. Furthermore, it could be used for performance analysis of tonal compositions if combined with traditional analytical techniques for performers. It could also potentially be modified and expanded for applicability to non-Western musics and pretonal compositions.

In traditional tonal music, musical structures frequently take on particular functions within a composition. This has been discussed in great detail by William E. Caplin in his book *Classical Form: A Theory of Formal Functions for the Instrumental Music of Haydn, Mozart, and Beethoven*. Formal functions also exist in music of the twentieth and twenty-first centuries,
and expanding this method in the direction of determining formal function would be highly beneficial for performers.

Many of the rules, guidelines, and techniques proposed in this thesis were established primarily through the formalization of intuition. They were tested to a limited extent on several pieces and excerpts to establish a reasonable level of accurate functionality. However, further refinement of these rules, guidelines, and techniques could be accomplished by testing them on a greater number and wider variety of compositions from the twentieth-century literature. Refinement would be especially beneficial in certain areas including (but not limited to): (a) establishing the significance of parametric changes within a piece, (b) producing phrase-length windows, (c) comparing intensity peaks, and (d) determining weighted importance of parametric changes and intensifiers in general. Such improvements could help to produce more definitive results in terms of segmentation, the assignment of climaxes, and in dealing with more complex phrase shapes.

While the method presented here has the potential for significant improvement, expansion, and refinement, what has been established may be of great value for any performer with underdeveloped intuition. The method assists the performer in taking all aspects of a composition into account and in synthesizing that information to create an interpretation that is logical, coherent, and potentially far more musically satisfying than if the performer does not use the method.
## APPENDIX A: FORM CHART OF WUORINEN’S DIVERTIMENTO

<table>
<thead>
<tr>
<th>Sections</th>
<th>Subsections</th>
<th>Phrase Groups</th>
<th>Phrases</th>
<th>Reasons for phrase segmentation(^1)</th>
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<tr>
<td>1.1–67.4</td>
<td>1.1–29.1</td>
<td>1.1–14.1</td>
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<td>4.4–10.1</td>
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<td></td>
<td>10.2–14.1</td>
<td>Rest, saxophone register change, motivic parallelism</td>
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<td>14.2–29.1</td>
<td>Dynamic change, motivic parallelism</td>
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<td>29.2–33.1</td>
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<td>33.2–40.2</td>
<td>Rest</td>
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<td>Tempo change, rest</td>
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<td>130.2–137.3</td>
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<td>138.1–188.3</td>
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<td>157.4–167.1</td>
<td>Rest, saxophone register change</td>
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<td>167.2–178.3</td>
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<td>179.1–188.3</td>
<td>Tempo change, saxophone register change</td>
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<td>189.1–261.3</td>
<td>189.1–242.2</td>
<td>189.1–201.3</td>
<td>Rest</td>
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<td>202.1–242.2</td>
<td>Saxophone register change, motivic parallelism</td>
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<td>222.2–242.2</td>
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<td>242.3–255.3</td>
<td>Rest, saxophone register change, dynamic change</td>
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<td>256.1–261.3</td>
<td>256.1–261.3</td>
<td>256.1–261.3</td>
<td>Rest</td>
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1. Comments address the end boundary of each phrase.
APPENDIX C: INTENSITY MAP OF WUORINEN’S DIVERTIMENTO
APPENDIX D: SUMMARY OF MOTIVIC AND PITCH ANALYSIS OF WUORINEN’S
DIVERTIMENTO

The following observations are regarding local and global motivic and pc-set relationships within Charles Wuorinen’s Divertimento for Alto Saxophone and Piano.

Local motivic and pc-set relationships:

<table>
<thead>
<tr>
<th>Measures</th>
<th>Observation</th>
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<tr>
<td>1–2 and 3–4</td>
<td>Both feature A3 to B3 motive</td>
</tr>
<tr>
<td>1–7</td>
<td>G#3, A3, A#3(Bb3), and B3 featured prominently</td>
</tr>
<tr>
<td>14–17</td>
<td>A3 and B3 featured prominently</td>
</tr>
<tr>
<td>19–23</td>
<td>Melody features interval 11</td>
</tr>
<tr>
<td>22–25 and 27</td>
<td>Melody features several long, metrically strong G#5s</td>
</tr>
<tr>
<td>47–48</td>
<td>Dotted-sixteenth, thirty-second note rhythm relatively frequent</td>
</tr>
<tr>
<td>68–75</td>
<td>Pcs 5 and 7 featured prominently</td>
</tr>
<tr>
<td>88–90</td>
<td>Melody features descending interval 11</td>
</tr>
<tr>
<td>91–94</td>
<td>Metrically prominent E5 relatively abundant</td>
</tr>
<tr>
<td>100–103</td>
<td>Dotted-sixteenth, thirty-second note rhythm relatively frequent</td>
</tr>
<tr>
<td>113–15</td>
<td>Pitch material nearly exclusively C2, Db2, Eb2, and F2.</td>
</tr>
<tr>
<td>115–16</td>
<td>Dotted-sixteenth, thirty-second note rhythm relatively frequent, pcs 5 and 7 featured prominently</td>
</tr>
<tr>
<td>146–49</td>
<td>Melody features intervals 11 and 13 (always starting from metrically prominent locations)</td>
</tr>
<tr>
<td>179–81</td>
<td>Pitch material exclusively E4, F4, and G4</td>
</tr>
<tr>
<td>179–87</td>
<td>Pcs 5 and 7 featured prominently</td>
</tr>
<tr>
<td>189–95</td>
<td>Pcs 1 and 3 featured prominently</td>
</tr>
<tr>
<td>205–206, 216–17, and 245–47</td>
<td>Melody features pc row 0, 4, 7, 1, t, 5, 0</td>
</tr>
<tr>
<td>242–44</td>
<td>Pcs 1 and 3 featured prominently</td>
</tr>
<tr>
<td>256–61</td>
<td>F4 featured nearly exclusively</td>
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</table>

Global motivic and pc-set relationships:

<table>
<thead>
<tr>
<th>Section 1 (1–67)</th>
<th>Section 2 (68–137, 138–188)</th>
<th>Section 3 (189–261)</th>
<th>Relationships between sections</th>
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<tbody>
<tr>
<td>mm. 1–2, 3–4</td>
<td>68–70</td>
<td>189–90</td>
<td>Motivic similarity (Slide up by whole step) and pc material related by T8 transposition</td>
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<td></td>
<td>72–81</td>
<td>192–201</td>
<td>Motivic similarities (primarily rhythmic patterns) and pc material related by T8 transposition</td>
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<td>14–66</td>
<td>83–135</td>
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<td>Motivic similarities and pc material related by T8 transposition</td>
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<td>138–45</td>
<td>202–12</td>
<td>Motivic similarities (primarily rhythmic patterns) and pc material related by T8 transposition</td>
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<td>147–50</td>
<td>218–20</td>
<td>Pc material related by T8 relationships</td>
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<td>152</td>
<td>221</td>
<td>Motivic similarity (rhythmic piano motive), Sax lines’ pc material related by T8 transposition</td>
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<td>Motivic similarities and pc material related by T8 transposition</td>
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<td>183–87</td>
<td>251–55</td>
<td>Verbatim repetition of pitches, rhythms</td>
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BIBLIOGRAPHY


