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A Theory of Form as Temporal Referentiality

Eron F. Smith
Pomona College

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A THEORY OF FORM AS TEMPORAL REFERENTIALITY

Eron Frances Smith

Pomona College, Class of 2016

ADVISORS:

ALFRED CRAMER & JOTI ROCKWELL

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Bachelor of Arts in Music with a concentration in music theory*

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Abstract

This study proposes temporal referentiality—roughly defined as the orientation of substance in its temporal medium—as a theoretical and analytical framework for musical form. Operating on the principle of music as a temporally extended entity, I explore the connections that occur between substance across its medium. I suggest an additional interpretation of medium connections (temporality) in terms of language tense and explore substance connections (referentiality) through different types of filtering.

At any given moment, a piece of music could be said to reference its own relative past and future to some degree. This temporal orientation is analogous to tense in that stable temporal relationships exist regardless of from which point in real, external time they are considered. A musical, analytical tense, rather than directly evoking outside events as does language tense, is fluid, existing on a spectrum from a stronger to weaker past or future.

This project proposes a means for a visual and literary interpretation of temporal referentiality, aimed at depicting a network of substance relationships established over a piece's timespace. An analysis of this type assumes a listener's complete familiarity with the substance in its temporal boundaries, encapsulating a piece of music as an expanded instant to navigate through time as one would space. Visual representations portray the amount and strength of future- and past-oriented musical substance at a given point in time, including which sections are connected to one another (medium connection) and which variables or features of sameness are responsible for this connection (substance connection). Employing an analogy between orientation and tense, it also becomes feasible to construct a "model prose composition" with the same temporal referentiality as a piece of music, translating musical form into language and potentially vice versa. Finally, I introduce a system of filtering to isolate portions of medium and substance to clarify what elements are responsible

for the elusive concept of referential “sameness.” The possibilities for temporal reference analysis are here applied to the first movements of Bartók’s Fourth String Quartet and Brahms’s Violin Concerto, as well as Bach’s Contrapunctus #9 from *The Art of Fugue* and the Variations movement of Webern’s Symphony op. 21.

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“The most important thing I learned on Tralfamadore was that when a person dies he only *appears* to die. He is still very much alive in the past ... All moments, past, present and future, always have existed, always will exist. The Tralfamadorians can look at all the different moments just that way we can look at a stretch of the Rocky Mountains, for instance. They can see how permanent all the moments are, and they can look at any moment that interests them. It is just an illusion we have here on Earth that one moment follows another one, like beads on a string, and that once a moment is gone it is gone forever.”

-Kurt Vonnegut, *Slaughterhouse-Five* (1972)

CHAPTER I

A THEORY OF FORM AS TEMPORAL REFERENTIALITY

To look at a diagram of musical form is to look at a visual representation of a piece's course through time from future to past. A form diagram bears some relationship to the course of real time through the piece's timespace. Typically, analysis has an order component; beyond ordering, the *relationship* established between different portions of a piece defines form, making it an interesting and fruitful subject for analysis. Examining and presenting the form of a piece involves tackling questions of the relationships established over the course of time. To say a movement is in ABA form, for instance, establishes not only the presence of three discernible sections, but also that the first and third are reproductions of one another, with the second standing alone. Similarly, normative formal terminology such as *recapitulation* implies the existence of an *exposition* at a prior point in time. In this study, I explore the possibility of interpreting musical form through visual representations of a piece's internal references across time. For example, the first sixteen bars of Bach's Minuet in G Major (BWV Anh. 116) are represented in Fig. 1.1:

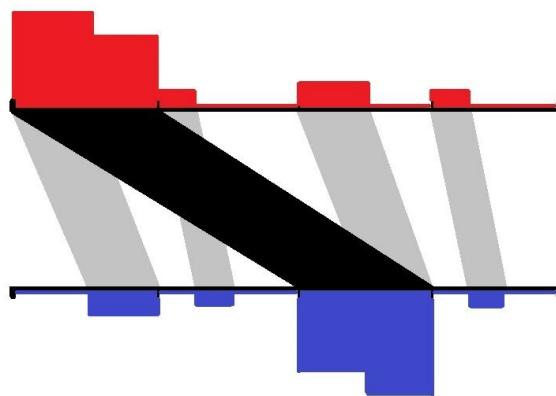


Fig. 1.1 Bach, Minuet in G Major BWV Anh. 116, temporal reference diagram of first 16 bars

In the diagram above, the two horizontal lines represent one and the same linear timeline, on which time moves from left to right. The red bars above the upper timeline denote the amount the music is referencing the future with respect to the given position in time; the blue figures below the lower timeline indicate the degree to which the piece references the past at the current moment. The greyscale stripes between the two linear time references the past at the current moment. The greyscale stripes between the two linear time “axes” show to what the red or blue corresponds, connecting pairs referring to one another and loosely color-coded to reinforce the visual of referential strength (darker color ~ stronger reference).



Fig. 1.2 Bach, Minuet in G Major BWV Anh. 116, m. 1-16

Even before further elaboration on the technique used to derive such a visual representation, a glance at the Bach diagram reveals a division into two eight-bar phrases, the first halves of which are referentially connected to one another. The first four measures of the first phrase point futurewards toward the first four bars of the second phrase; within this four-bar figure, the same two measures repeat twice each time. The fifth and sixth bars of each phrase are identical to each other, though not to the corresponding part of the complementary phrase. The concluding bars of each eight-measure phrase appear relatively

unique and thus non-referential within the selected span of musical time. I elaborate below on the processes for reading and interpreting such a diagram.

I. VISUALIZING TEMPORAL REFERENTIALITY

Though my temporal reference diagrams are not quantitatively precise graphs, it seems appropriate to start from an explanation of the horizontal and vertical components of the diagram.

The ‘x’ axis is the *linear time axis*, analogous to phenomenology’s “stream of nows.” In listening to a piece, *external time*, or the unidirectional flow of time independent of the piece, and *internal time*, or the subjective timeline captured in and by the piece, move from left to right by countable units (seconds, measures, beats, etc.).¹ This horizontal line, regardless of its units, represents a continuous flow of time from which referential disruptions emerge. The span of the X axis represents the boundaries of the piece’s internal *timespace*: its beginning and end.

A temporal reference analysis seeks to answer the question of how and where sections of sameness interact within the confines of a piece’s timespace as pre- and reiterations.² A temporal reference diagram is a graphic rendering of this question, displaying three properties: magnitude, temporality, and connection. Each of these components corresponds to a more specific analytic question: *Magnitude* asks how strong the reference is,

¹ The importance of time in analyzing music, non-linear conceptions of time, and the notion of disrupting the flow of real time in order to create alternate streams of time have previously been established or assumed by Kramer (1988), Xenakis (1989), McInerney (1991), Leong (2001), Brubaker (2009), Delaere (2009), and Monelle (2010), among others. The external/internal time divide appears with similar definitions under many terms: objective/subjective, measured/experienced, and Kramer’s profane/sacred and linear/spatial (17), among others.

² My conception of references as interactions of sameness relates to Chagas’s (2014) idea of an “organic spectral-temporal structure unified through self-similarity,” or “reproducing a piece’s self recursively.” Overall unity of sound depends on a musical event’s ability to stand out as distinct against the background of other events. Morgan’s (1998) writings on symmetry also adopt a considerable focus on sameness, exploring the many ways in which two or more things can be the same.

temporality deals with its orientation(s) toward past, future, both, or neither,³ and *connection* links a reference to its pair, group, or network, specifying the relative location in timespace of the occurring sameness.

Though the diagrams do not specifically employ a ‘y’ axis,⁴ the vertical component encompasses both magnitude and temporality. The combined distances of red and blue from the linear time axis indicate magnitude, whereas the discrete amounts of red and blue indicate past/future orientation. For example, a section with a judged magnitude of n (relative but unquantified) may have any ratio of past to future orientation; magnitude operates independently from temporality.⁵ The distribution between future and past depends on the amount of corresponding sameness before and after a section.⁶ Visually, a swath of pure red without corresponding blue indicates a section that points entirely toward the piece’s internal future. This section has not previously occurred in real time, but will return later in the piece’s internal timespace. A blue section without an accompanying red section similarly marks a purely past-oriented section, meaning that the current material has occurred already but will not return again. Often, diagrams will have many locations at which blue and red coexist, indicating material that has already occurred in some form but that has not yet finished returning.⁷ Sections with no blue or red—in other words, where the magnitude is

³ My concept of temporal orientation is related to phenomenological literature such as Mensch (2014), who discusses and visually represents protention, retention and notions of “sinking into pastness.” I also borrow Feld’s (2005) use of the term “orientation” to indicate a referential connection between two sections of a piece.

⁴ Illustratively, the positive-negative number divide across the ‘x’ axis usually implied for a quantitative ‘y’ axis is not present. As a piece moves forward in external time, it does drop across the linear time axis and transition from future to past, but does not make this transition instantaneously. The positive and negative halves of the ‘y’ axis are not precisely a *continuation* of one another, but rather are more analogous to mirror images of situations in time. The ‘y’ axis is relative rather than quantitative, intended to illustrate comparatively the degree to which a certain amount of sameness occupies past and future temporality.

⁵ In this way my use of “orientation” differs from Feld’s (2005): He actively refrains from ascribing any degree to connections between sections, claiming orientation as either present or absent.

⁶ As mentioned below, the element of sameness for analysis necessarily corresponds to the music being analyzed. In analyzing the Bartók, I focus primarily on “theme” as expressed through rhythm and pitch contour, as the sameness element. Other elements such as harmony, style, and texture play a secondary role in determining the degree to which two passages are the same or different. For more on these elements, see Chapter III.

⁷ For more on the coexistence of past and future temporality, see Schirmacher’s (2012) discussion of the “paspresenture” in music and literature. I address references as verb tenses further in Chapter II.

zero—do not possess a significant quantity of sameness with any other area of the piece.⁸ In Fig. 1.3 below, all three sections have the same magnitude of referentiality.⁹ The first reference is oriented entirely to the future, the second points equally to the past and to the future, and the third points entirely to the past.

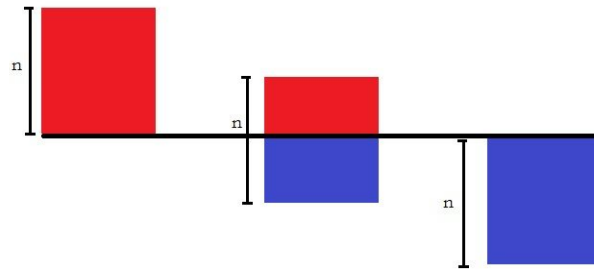


Fig. 1.3 A diagram of three referential sections in an imagined piece

Although the figure above indicates the magnitude and temporality of the provided references, it may still be unclear to which sections the references correspond. Though correspondence seems relatively straightforward in the given example (it appears to be a representation of the same section occurring three times), when many references coexist in a piece, connections become more ambiguous in its resulting diagram. The grey stripes present in Fig. 1.1 clarify these connections, pulling apart the ‘x’ axis to create a visualization of referential pairs and networks.

⁸ Monelle (2010) describes form as occurring when the present cannot be sustained; Hasty (1986) similarly discusses presence as free from connection with past and future. I employ these concepts here to mean that a *lack* of referentiality means the present—the flow of external time—is still sustained, with the amount of formal unity defined by the amount of substance disrupting the present.

⁹ In constructing or deconstructing a temporal reference diagram, it is crucial to distinguish between shifts in magnitude and orientation. A decrease in the amount of future-oriented referentiality, for example, does not automatically entail an increase in past-oriented referentiality. Analysis requires a representation of both red and blue in order to examine changes in these components.

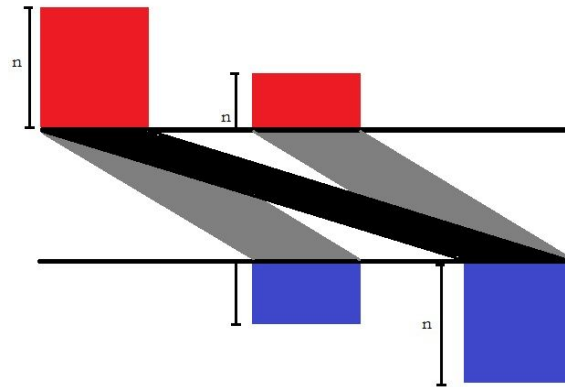


Fig. 1.4 A diagram of three referential sections, with connections indicated in grey

The stripes between the upper and lower (but identical) ‘x’ axes connect future-oriented material to its past-oriented complement(s). In this version of the diagram, it is clear that all three sections correspond to one another.¹⁰ The physical orientations of the connectors capture the temporal orientation of past and future: Starting from a future-oriented reference and tracing the connector brings the analyst forward in time, while tracing from the corresponding past-oriented reference moves in the opposite real-time direction. Sections belonging to both past and future temporalities are located at the end of one referential stripe and the beginning of another, as demonstrated in Fig. 1.4.

Aside from visualizing correspondences and referential links, connectors also provide a second means of seeing the amount and distribution of structural unity within a piece. The presence of more connectors also makes it more difficult to visually untangle the web of stripes; for clarity, the stripes are rendered in different shades from grey to black, with lighter connectors roughly corresponding to lower-magnitude references and superimposed darker connectors indicating large-scale high-magnitude references.

¹⁰ With this clarification of connection comes a slight loss of intuitive visualization of material dropping from future to past—the middle section’s magnitude is distorted by its being shared between future and past temporalities. In reading a section’s referential magnitude, the past and future components must be combined while ignoring the deceptive visualization of the added “null distance” between the ‘x’ axes.

Broadly speaking, the connection component is more intuitive. By looking at a temporal reference diagram, then, an analyst or reader is able to visualize patterns of sameness: Where do the piece's recurring ideas enter and exit? Does the piece begin and end with strong references or none at all? Which areas are oriented most strongly toward the past and future? Which areas are closest to a real-time (external time) flow and where are they with respect to strongly past- and future-oriented blocks?

II. FROM DECONSTRUCTION TO CONSTRUCTION: PRODUCING TEMPORAL REFERENCE DIAGRAMS

Using the information above to read a diagram, one can gain a general sense as a piece progresses on the linear time axis for how strong references are, the distribution of past and future orientations, and the pairs and networks that share information.

Constructing temporal reference diagrams brings more technical questions: It seems easier to determine which way a reference is oriented and to where it is connected, but what establishes how *strong* a reference is—in other words, what is magnitude? How does one go from a score, recording, or other medium to a detailed diagram?

II.1 Judging magnitude

Strong referentiality in a piece denotes strong structural unity, the presence of a complex system of formal establishments. The referential magnitude, here defined as the degree to which a section references the future and the past combined, depends on four elements.¹¹ *Faithfulness* consists of the amount of sameness between a referential pair or

¹¹ Rather than explicitly distinguishing large- or small-scale formal sections, I use referential magnitude as a means of fluidizing structural hierarchy. Compare this to the labeled sections of Hepokoski and Darcy (2006) or Schenker (trans. 1979); see Schachter and Straus (1998) on transformations and elaborations breaking down the

group; a certain threshold of sameness is required to identify something as a reference. The *duration* of a section also strengthens or weakens its referentiality, providing more cumulative sameness for the listener. The *number of iterations* further reinforces sameness by creating a more extensive referential network. The final element, *interim duration*, is defined by time elapsed between inter-referential sections.

II.1.1 Faithfulness

If no sameness exists between two sections, no reference exists, and thus the referential magnitude would be close to zero (expressed visually by a lack of red or blue above and below the linear time axis). If two sections are a precise repetition of one another, they possess the maximum amount of sameness possible save for occupying the same position in time, and therefore have a higher referential magnitude. I call this property “faithfulness”; if the sameness between references is unrecognizable to the listener-analyst, the two sections are minimally faithful reproductions of one another.¹²

Faithfulness does not necessarily remain constant throughout a referential section; one can imagine, for instance, an eight-bar melody in which the seventh bar is different between the first and second iterations. In other cases, two sections may start out with a high degree of corresponding faithfulness to one another, but then diverge, eventually ceasing to reference one another.

apparent rigidity of Schenkerian levels. Narmour (1977) also calls for this type of hierarchic fluidity in his suggestion of “networks” replacing “tree branches” in layered analysis.

¹² For example, a referential section that is exactly the same as its sibling, save for key area, instrumental distribution of notes, or volume, is highly recognizable, having a significant amount of sameness and thus higher referential magnitude. Conversely, a referential section that possesses *only* key area, orchestration, or a couple of notes in common with its supposed sibling may trigger only a minimal amount of referentiality. Granted, the analyst’s choices as to what constitutes sameness in a piece’s context, including treatment of large repeated sections, greatly affect the determination of faithfulness as a component to referential magnitude.

II.1.2 Duration¹³

Though faithfulness plays a crucial part in determining referential magnitude, it alone cannot account for strong referentiality. A less visually significant magnitude does not automatically entail minimal sameness. Imagine an isolated, brief idea with two particular chords each marked *sforzando* and orchestrated in a particular fashion. If this idea occurs twice verbatim in a piece, the two iterations may have a high level or even the maximum amount of sameness, but are unlikely to register as a high-magnitude reference due to the brevity of the idea. This premise is the *durational* element of magnitude. If an idea occupies a larger amount of time on the linear time axis, it has a higher magnitude than an idea occupying a shorter amount of time. A longer section possesses more sameness simply by virtue of containing more sounds and ideas possible to have in common with a sibling reference. Speaking in perceptual terms, there is more material to latch onto as “remembered” in either the future or past orientation. Longer sections constitute a larger percentage of the piece’s timespace; for a sizable section to be reproduced involves a greater deal of structural unity.¹⁴

II.1.3 Number of iterations

Imagine, now, that a brief idea such as the one above occurs nine times over the course of the piece. Even if faithfulness and duration are relatively insignificant for this idea, the frequency of its occurrence boosts its magnitude. Intuitively, an idea that will return

¹³ In some respects, faithfulness and duration are reflections of the same component of magnitude. Faithfulness accounts for how *closely* a referential pair or network matches, whereas duration accounts for how *long*. The two could be combined into a single component of cumulative sameness, illustrating how long an idea matches closely enough to register as a reference. I separate them for clarity.

¹⁴ Notably, duration over larger areas can be interrupted—e.g. two measures are unrecognizable from each other across a referential pair with otherwise high faithfulness—without the reference’s ‘length’ in time necessarily resetting. This factor depends on the brevity of the deviation compared to the duration overall.

several times over the course of the piece seems stronger than an idea with the same duration and faithfulness that returns only once: the sameness accumulated with each iteration reinforces the structural importance and hence referential magnitude of a recurring idea.

II.1.4 Interim duration

The final component of referential magnitude, and the most potentially problematic, is interim duration, or the span of time between the beginning of inter-referential sections. The longer the span of time between the two starting points, the greater the referential magnitude. This phenomenon comes from the hierarchy of local and global formal structures as well as from perceptual justifications. The more difference established between areas of sameness, the more striking the sameness upon its return and the higher the referential magnitude. Immediate or local references, such as a four-bar phrase repeating directly after itself, have only the internal difference within that referential timespan (and, if not an immediate repetition, perhaps a few short differences following the referential section's completion) to reinforce their own sameness.¹⁵ Long-term references also relate to cyclic unity; a referential link between the beginning and end of a piece's timespace can emphasize the containment and independence of the timespace.¹⁶

¹⁵ The question arises of links between duration and interim duration. If the aforementioned example of a brief two-chord idea is stretched across a greater span of time, it does not seem, intuitively, as if these two iterations should become more referential. Rather, it would seem that the shorter duration overwhelms the effects of a longer interim duration. Gravitationally speaking, two objects further away from each other must be more massive—longer, in this case—in order to maintain the same amount of force, or referential magnitude, between them. Shorter-duration references under a certain threshold are subject to forgetting, or being overwhelmed by comparatively massive amounts of sameness. Rather than difference accentuating the familiarity of these sections upon their return, they possess insufficient sameness within themselves for this contrast to be effective.

¹⁶ In Taylor's (2011) terms, this type of cyclic form is specifically *circular*, with "cyclic" denoting any pattern of returning material.

For referential groups rather than referential pairs, the distance determining interim duration is the distance between the farthest two iterations of the reference. All three or more iterations may still share the same magnitude.

Combining faithfulness, duration, number of iterations, and interim duration, the analyst determines a relative magnitude throughout a piece's timespace. A high magnitude suggests some combination of the four; closer examination of the piece in question is necessary to determine which play into portraying the given level of referentiality.

II.2 From background to foreground and back again

Producing a temporal reference diagram for a piece entails determining the distribution of sameness in real time. In listening to the piece and/or examining its score, the analyst evaluates the magnitude, temporal orientation, and connection of each portion, starting from a background sketch and zooming in to higher analytical resolutions to produce a foreground diagram. After determining the micro-level references and producing local foreground diagrams, the analysis then zooms out by comparing corresponding sections on this local scale to revise the middleground and background diagrams using the higher resolution.¹⁷

II.2.1 Zooming in: Background

The background stage consists of a superficial search for macroscopic (that is, long-duration) areas of sameness in a piece. A background analysis seeks only a few lengthy

¹⁷ I imagine resolution as analogous to calculating an integral by drawing rectangles under the non-quantified curves of past and future. In this sense, my analytical layers still correspond to the definition of "layer" in *The New Grove Dictionary of Music and Musicians* in that different layers range in level of detail, with the exception that the most detailed level would still not yield something that could reproduce the music analyzed.

referential pairs or groups, roughly indicating beginnings and endings. This diagram acts as a point of departure, perhaps not even recognizable as the same subject as the later foreground diagram. Depending on the degree of faithfulness in the piece, the background diagram may be a useful approximation or not.¹⁸

II.2.2 Zooming in: Middleground

After establishing a rough idea of regions of sameness and temporality, a middleground analysis identifies smaller, more precise sections. These sections may be determined in two ways: continuity and distinction. Continuity breaks down sections based on where they deviate referentially from corresponding pairs and networks. For example, a piece with approximate form ABCDACB would be divided into middleground subgroups A, B, C, and D, since no referential area can easily be condensed into one section such as “AB” or “CD.” A piece with form ABCDABC, however, would be reduced by continuity to (ABC)D(ABC) or perhaps ABA, given that A, B, and C appear both times in the same continuous sequence. More simply put, a continuity division of middleground analysis would classify as one subgroup any section that would appear as one unified connector stripe. A division of subgroups by distinction operates the same way as many existing formal analyses, looking loosely to divisions of sameness *within* sections. In other words, if AB always occur in succession, but A and B have very different thematic material, rhythms, key areas, etc., the two would be classified as separate sections even before the foreground analysis. In my

¹⁸ Schenker’s background, middleground, and foreground could be described as harmonic reductions representing underlying pitch patterns, absorbing formal analysis into harmony. My use of Schenker’s terminology directly and intentionally evokes ideas of structural hierarchy, analytical process, and formal unity through relationships established over extended periods of time within a piece; however, my use of this terminology indicates referential “resolution” rather than direct structural significance. In other words, where Schenker’s background is the fundamental structure of a piece, my background is a low-resolution sketch of a piece’s references, a starting point rather than an underlying truth. My use of “background” also does not speak directly to the structural importance of an event; I express this through referential magnitude, discussed above.

analyses below, I employ both of these techniques as seems appropriate, occasionally mixing the two by using labels—e.g. A(i) and A(ii)—that group sections together while still marking their informational distinction from one another.

In the middleground analysis stage, it becomes possible to approximate the magnitudes of each of the subgroups, as duration, number of iterations, and interim duration can frequently be approximated by these subgroups. The most detailed stage of analysis, foreground, takes each subgroup with all its iterations and treats it as its own internal timespace, locating references on a microscopic scale.

II.2.3 Zooming in: Micro-level foreground

Foreground analysis is analogous to examining phrase structures or perhaps motives in more traditional formal analysis.¹⁹ The first, micro-level portion of a foreground analysis isolates each subgroup and its iterations, seeking out local references in phrases or small-scale sequences while disregarding correspondence between sections. These may be diagrammed separately, as they do not appear clearly on the diagram of the entire piece or movement. The foreground analysis also may include sections that appear non-referential on larger scales.

II.2.4 Zooming out: Comparative foreground

Following these local treatments of referentiality, the foreground analysis then looks at measure-to-measure correspondence between iterations and reevaluates how the

¹⁹ The large-to-small analytical method places temporal referentiality in the “top-down” category of formal analysis, as opposed to a “bottom-up” analysis that would start from phrase structure and move into larger groupings. Zbikowski (2005) addresses the advantages and disadvantages of each of these types of formal analysis in approaching hierarchy.

magnitude changes appear in middleground subgroups (e.g. accounting for two non-referential measures within an otherwise strongly referential iteration) to connect the middleground and foreground analyses. Visual representations of the micro-level foreground appear as diagrams of local-only references within an iteration, while the comparative-level foreground displays magnitude fluctuations caused by differences and similarities between different iterations of the same subgroup.

II.2.5 Zooming out: Middleground and background

Having established the relative magnitudes of the *iterations* of each subgroup, it becomes possible to approximate overall faithfulness, duration, number of iterations, and interim durations for each subgroup as a whole, producing relative magnitudes for each subgroup with respect to each other and combining any as applicable to produce the overall past and future figures for the piece as a whole.

III. MODELS OF TEMPORAL REFERENCE FORMS

Employing the above strategies for reading and constructing temporal reference diagrams, the following models can be used as an analytical phrasebook between established formal representations and the proposed visualization method. Alternatively, they can be used as tools to test applicability of various background formal templates to a piece as analyzed in terms of temporal referentiality.

A null model, completely devoid of intratemporal references in a piece's timespace, would be visualized simply as the linear time axis alone, a horizontal black line. Though this model seems extremely minimalistic, it is conceptually quite difficult to imagine a piece with absolutely no sameness. At a microscopic level, it seems that even a repeated utterance of

the same note or basic rhythmic pattern would register as a reference in such a drastic effort to avoid anything more conspicuous.²⁰ One can more realistically imagine a diagram for a structure described as AA or ABA: Each would have a large future-oriented block followed by a large past-oriented block, with the ABA form having an additional non-referential (null) section between the two blocks.

In addition to basic models, it may also be useful to attempt renderings of existing formal models within the proposed framework. For example, a rondo with the approximate form ABACABA would appear as in Fig. 1.5.

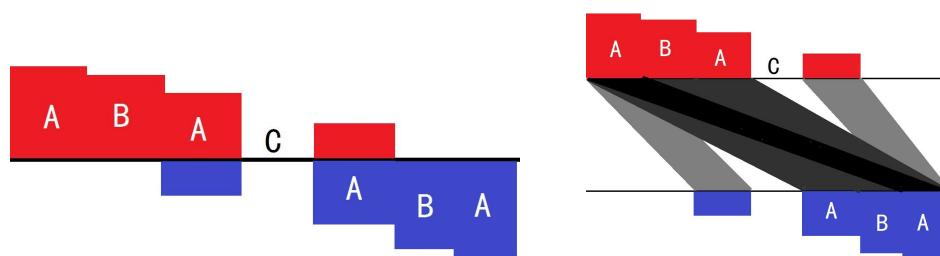


Fig. 1.5 ABACABA rondo with and without connectors, shown with section labels

Three different sections appear in this figure: A, B, and C. The A section occurs four times, creating a referential group. Each A section refers to all three of the others with the same magnitude, transitioning with each iteration from future to past. The B section, slightly lower in magnitude due to shorter interim duration and a smaller number of iterations, occurs twice: once exclusively future-oriented and once exclusively past-oriented. The C section stands on its own, referencing nothing else within the piece's timespace. In the second rondo figure, the large dark grey connector shows the reference of the ABA section to itself as a unit.

²⁰ Composers such as Brian Ferneyhough have explored the possibility of attempting to compose “without form”; see Dufourt (2010).

Attempting the same process as above for a sonata movement—one with a primary theme, transition, secondary theme, and closing in both exposition and recapitulation—could yield some variant of Fig. 1.6.

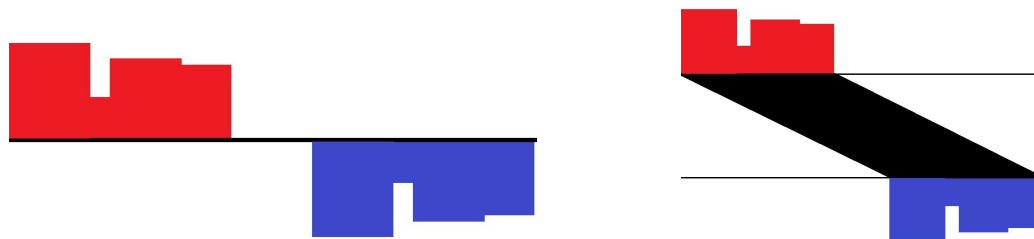


Fig. 1.6 A hypothetical sonata movement with and without connectors

In this hypothetical sonata movement, the first theme repeats exactly between the exposition and the recapitulation. The transition is notably less referential as a result of the two iterations transitioning differently to a secondary key area versus back to the home key area. The second theme is here shown as being of slightly lower magnitude than the first theme due to the two iterations' different key areas. Perhaps the two closings, having slightly less magnitude than the second theme, deviate slightly in melodic content. From this diagram, the analyst-reader can also deduce a lack of introduction or coda as well as a relatively brief development section. Though this imaginary sonata movement certainly differs from many others even with the same theme structure, it is easily imaginable that other sonata movements may be recognizable as variants of this diagram, though they may be dissimilar in relative durations and magnitudes.

By way of exploring the wide scope of these models, one model for a Top-40-style pop song is shown in Fig. 1.7.

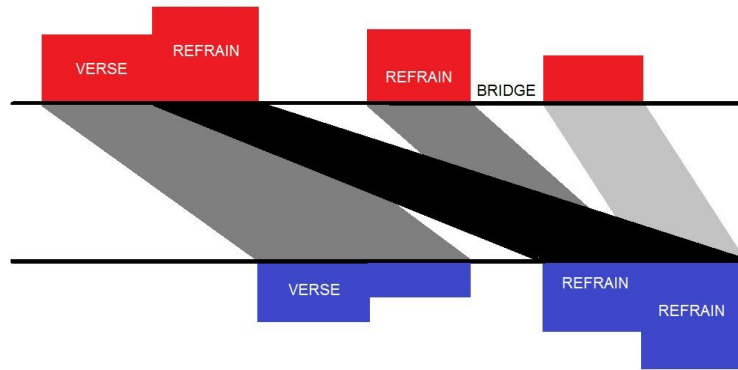


Fig. 1.7 Model for a contemporary pop song, with connectors

In this model, a small introduction is followed by a first verse, a chorus (or refrain), a second verse, the chorus again, a bridge section, and the chorus two more times. This layout produces two referential subgroups: “verse” and “chorus,” given that the introduction and the bridge are treated as non-referential on a global scale. The chorus, occurring four times, has the higher magnitude compared to the verse, occurring only two times. Incorporating words into the measure of faithfulness between subgroup iterations would further increase the discrepancy between verse and chorus magnitude.

A model for a particular type of minimalist piece might appear as a diagonal parallelogram, a gradual, linear decrease in future-oriented material with parallel increase in past-oriented material. This model is based on the idea of a motive or module repeated a large number of times throughout the course of a piece. The duration and interim duration of this module are shorter, but the number of iterations strengthens its overall referentiality, as does faithfulness.

In each of the models, the diagrams with connectors may appear somewhat redundant; the order is relatively obvious from the descriptions of the models and simple process of elimination. They are included as a reminder that these are idealized models and that diagrams generated from real pieces are considerably more complex and less obvious as to the correspondence of various shapes.

III.1 Model patterns

In dealing with temporal reference analysis, two visual figures emerge that give us clues into the formal makeup of a piece: stairsteps and plateaus. Stairsteps occur when there is a sequence of adjacent repeated material. The visual effect of stairsteps arises when a brief idea occurs in some manifestation several times in a row, creating an internal pocket of local referentiality. With each iteration of the idea, its orientation shifts pastward until the sequence has finished, each iteration forming a step. A plateau, by contrast, indicates that a section is mostly non-referential to itself (e.g. does not rely heavily on sequences) and rather constitutes a more macroscopic reference to later material. The two figures are far from concrete and may easily exist simultaneously or even ambiguously, given that one could describe stairsteps as microscopic plateaus or plateaus as macroscopic stairsteps.

IV. ANALYSIS: BARTÓK STRING QUARTET #4, FIRST MOVEMENT

Bartók's music seems particularly appropriate for temporal reference analysis due to carefully planned relationships between local motives and global form.²¹ Bernard (2014) notes the continuing prevalence of traditional formal analysis of his string quartets, propagated in part by the composer's own sonata-type analysis included in publication. Bernard calls for different approaches to Bartók's work; Leong (2001), for instance, has analyzed his music with respect to time-spaces. The following analysis presents temporal referentiality as another such alternative.

²¹ Babbitt (1949) was an early identifier of this characteristic, particularly noting Bartók's use of thematic unity between movements.

IV.1 Background analysis

There is a certain degree of similarity in terms of melody, contour, rhythm, and part relationships, among other elements, between m. 1-48 and m. 93-135.²² M. 49-74 share some of the beginning material from these two sections, though to a lesser overall extent. M. 82-91 and m. 136-156 share many of the same rhythmic and contour elements, though the latter greatly extends the length of the former. In other words, a sketch of this movement's background form would reveal references (1) between the two largest sections and the first part of the middle and (2) between the portion preceding the second larger section and the end of the movement.

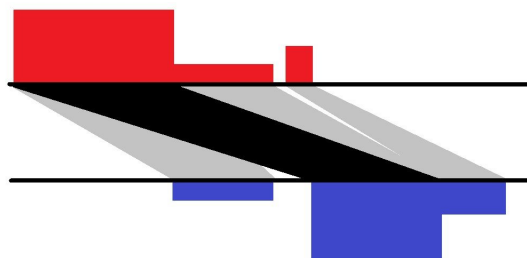


Fig. 1.8 A possible background diagram for Bartók's Fourth String Quartet, mvmt.

1

IV.2 Middleground analysis

I divide this movement into five referential subgroups, lettered A-E. A and C occur three times, always with A preceding C, but with other material interspersed the first two times; D and E occur two times each, always in that order but with interrupting material in

²² Bartók himself identified these sections as his exposition and recapitulation, with m. 49-92 being the development; see Delcambre-Monpoël (2004) for analytical ideas of this movement in these terms, tonality, and motives. Kárpáti (1975) also adopts a sonata-oriented approach to the Fourth Quartet.

the first sequence of the two; B acts as a disruptive figure, occurring four times: between and immediately after the first iteration of AC, after the third iteration of AC, and at the very end of the movement. D is the longest somewhat continuous section, though extended considerably on its second iteration compared to the first. Without accounting for referentiality, one could describe the middleground form of this movement based on these groups as ABCBDA_C_EACBDEB. I distinguish between different iterations of the same reference using numbers corresponding to their order in the piece.²³

A	m. 1-10 m. 49-51* m. 93-103	C	m. 14-26.5 m. 60-74 m. 104-115	E	m. 82-91 m. 136-156
B	m. 11-13 m. 26.5-29 m. 116-118 m. 157-159	D	m. 30-46 m. 119-135		

IV.3 Foreground analysis

IV.3.1 A group

A3 and A1 contain similar ideas and figures, the primary difference being that the first few measures in A3 are disrupted by one of the principal motives in the movement (occurring most concentratedly in the B group, discussed below).²⁴ The B motive occurs immediately prior to the beginning of A3 material, then again in measure 94.5, displacing the figure from the first two bars later by half a measure. This initial figure happens a third time, unlike in A1, before proceeding to the subsequent figure in m. 98, again preceded by an interjection by the B motive. Note that this motive is only disruptive in the middleground reference sense with respect to A1. On a local level, isolating A3, the B motive followed by

²³ Measure numbers are approximate, as many motives and phrases do not coincide with a downbeat.

²⁴ Wilson (2014) refers to this as the “agent motive,” highlighting its importance in the development of the movement and beyond.

the initial 2-bar figure shared with A1 forms a two-measure staircase pattern with three steps. On the middleground level, the B-motive interjections and the non-referential third iteration of the initial 2-bar figure drop A3 to the linear time axis. Again speaking locally, the figure in m. 98-100 points minimally forward to the pattern in bars 101-102, which forms a small staircase pattern itself before returning to a present orientation. Following the non-referentiality around m. 97, A3 and A1 rejoin, differing again at m. 100 and m. 103.

A2 is not a full-fledged reference, but rather an interjection or reminder of the A group. M. 49.5-50.5 are a snapshot out of the middle of A1 or A3, whereas m. 50.5-51 begin by continuing the snapshot and then turn to a glissando at the end, referencing the end of A3 more than of A1.

A1's referentiality with respect to A2 and A3 is relatively constant—nothing occurs in the span of A1 that does not return at all in A3, save for the temporary drops to present in m. 7 and 10, corresponding to those in m. 100 and 103. On a local scale, A1 consists of two adjacent two-measure blocks referencing one another, followed by two three-bar phrases. The first bar of the first three-bar phrase (m. 5) references the two similar patterns in m. 8 and 9.

Representing the above information in micro-level and comparative-level foreground diagrams for A1, A2, and A3 might appear as in Fig. 1.9 and 1.10.

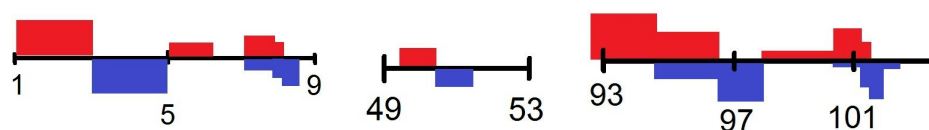


Fig. 1.9 Micro-level foreground relationships for A1, A2, and A3

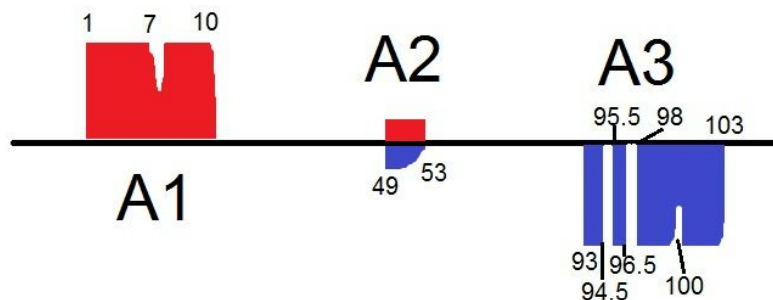


Fig. 1.10 Comparative-level foreground relationships for A1, A2, and A3



Fig. 1.11 Beginnings of the A group and B group

IV.3.2 B group

The B group is the shortest module, characterized mostly by one or more rhythmic patterns (particularly the B motive) staggered over a couple of measures. None of the four iterations are precisely alike rhythmically to another, but all are approximately the same length (between two and slightly over three measures) and have the same staggered pattern between voices echoing each other. Speaking rhythmically and in terms of contour, B3 and B2 are the most similar, perhaps due to their similar positioning with respect to other referential groups. Locally, B1, B2, and B3 begin with a two-stair step pattern of the B motive, after which they proceed to different patterns; B4 reiterates the second half of this motive and then repeats this B-and-a-half motive three times. It is difficult to produce an exact visualization for these small B groups due to the staggering in orchestration and the resolution required to produce any meaningful figure within two to three bars; however,

each would roughly resemble a staircase pattern (diminishing in magnitude near the end for B1-B3, continuing in B4 until its termination after three iterations). Comparatively, B3 and B2 have the highest amplitude by nature of having more sameness with each other, while B1 and B4 refer less faithfully to any of the other three iterations.

IV.3.3 C group

This group is perhaps the most difficult to parse due to the independence of the parts, the gradual shifting in melodies and ideas present, and the lack of defined phrases and sections. The C group feels more like a meditation on a certain idea, a gradual exhaustion of a mood, than a distinct section. Nonetheless, some commonalities are traceable between C1, C2, and C3.



Fig. 1.12 C group

C1 and C3's micro-level diagrams would take the form of a diagonal, staircase-style structure resulting from the lack of breaks and flowing eighth- and quarter-note lines. Three major differences emerge between C1 and C3: (1) C1 is the only iteration with the accompanying figure first introduced in the viola part (m. 14). This pattern serves as a loose ostinato of sorts, but is absent in both C2 and C3. (2) Though C3 fits the style of general continuity and motion found in C1, it borrows a melodic figure from C2 not found in C1 (the melody introduced in first violin and cello, m. 65). (3) The ending of C1 is distinct from

C2 and C3, inserting a “suspension” figure with a whole note and percussive syncopated accents before the subsequent breath mark found in all three.

C2 acts as an outlier, having a slightly distinct form from the other two iterations and arguably even referencing the A group. The first three bars ruminate on the melodic figure found in all three iterations; this melody is then cut off by a different rhythmic figure with sixteenth notes in m. 63-64, which seem to reference each other somewhat. M. 65-66 use a striking unison between first violin and cello, pointing forward in real time toward C3 (see viola just before m. 109, second violin just before m. 111) and resuming the diagonal, stairstep continuity found in C1 and C3. After finishing this idea, a noticeable phrase break occurs in m. 68, followed by staggered entrances related to the earlier C group melody (sharing contour with the cello in m. 60, for example) and potentially the A group (see the rhythm at the beginning of m. 5). This pattern occurs twice—m. 69-70 and 71-72—and produces a referential pair. A repeating sequence starting halfway through m. 72 begins a stairstep that carries through m. 74.

As I read the C group, C1 and C3 are most strongly linked, with C2 also sharing a significant amount of information. With respect to each other, C1 looks consistently forward until m. 22-24, which gradually decrease referentially until m. 25-26 break away entirely. C2 references C1 and C3 until m. 63, during which it drops to the present for 2 bars before resuming at a weaker magnitude in m. 65, looking much more strongly forward than backward. Bars 69-74 decrease considerably in magnitude, maintaining only a minimal connection to the first and third iterations. C3 continuously references the past, pointing first to C1 and then to C2 but never containing any entirely unique figures.

IV.3.4 D group

The two iterations of the D section differ from each other less in idea (here denoting rhythm, melodic contour, and/or motive) and more in terms of duration spent on certain ideas. The only notable contrast between D1 and D2 is the presence of a short, harsh figure in eighth notes in m. 37-38 (D1).

D2 could be approximately divided into three diagonal/stairstep figures: (a) m. 119-122/3,²⁵ which contain alternating beats of sixteenth notes in the viola and cello, punctuated by eighths and quarters alternating in the violins, (b) m. 124-126, with a staggered-entrance pattern reminiscent of the A group, and (c) a steady, heavy motoric pulse of eighth notes accompanied by chromatic sixteenth-note interjections, in all four instruments. D1 contains the same three stairstep figures, the first containing a more obvious reference between m. 30-31 and 32-33. Between the first and second is the non-referential alternating three-eighth-note interjection. Using the divisions above, the corresponding sections would be: (a) m. 30-37.5, [nonreferential section], (b) m. 39-43, and (c) m. 44-46.

Comparatively, D1 contains more material in stairstep section (b), while D2 has a much lengthier rendition of section (c). D1 breaks from being referential in m. 37.5-38 and becomes less referential after m. 41.²⁶ D2 is continuously referential up to m. 129, where its repetition of the pulse figure exceeds the length of D1.

²⁵ I hear m. 123 as a transitional point between the two surrounding stairstep figures, hence its ambiguity in the diagram.

²⁶ I render this non-referentiality as gradual, since it is unclear from the phrase structure and Bartók's writing which measure corresponds to which.



Fig. 1.13 Two examples of material from the D group

IV.3.5 E group

The E group references differ primarily by length and dynamics. E2 is considerably longer in duration than E1, and includes an expansion of the *piano* quarter note motive into a series of rising chords, followed by a staggered chromatic ascent easily connected to B2 or particularly B3. Both of these subsections are absent in E1. Since E1 contains no material completely absent from E2, it is consistently referential, while E2 decreases in magnitude toward the middle as it expands into the ascending quarter note figure (m. 141-145), dropping completely to the present from m. 145-151, and resuming referentiality in m. 152.

E1 would be visualized on a micro-level diagram as a simple, consistent diagonal stairstep figure. E2 would have this same stairstep figure divided in the middle, with three smaller stairsteps inserted between the larger one. Measures 140-145.5 would consist of three two-measure steps, with m. 145.5-148 and 149-151 forming diagonal downward slopes before resuming the full referentiality to E1.



Fig. 1.14 Example of E group idea

IV.3.6 Locally referential sections

This movement has very little material that cannot be traced in some form to one of the middleground reference groups. The consistent appearance of staggered entrances and muddy melody-accompaniment textures results in a stairstep-heavy diagram rather than a blocky plateau-based shape. Three small areas have not yet been mentioned in the above categories: These are measures 47-48, 52-59, and 75-81. Surprisingly straightforward, they appear in clear step patterns on a local level.

IV.3.7 Zooming out

Having established all of the local referentiality and the relationships between individual groups, it is then possible to determine relative magnitude for the groups.²⁷ The A group, for instance, has relatively high amplitude because of the faithfulness between A1 and A3. The small interruptions in A3 are insufficient for disrupting the overall duration of the section, and A is one of the few sections to be strong enough referentially to track some specific measures corresponding to one another. B has considerably lower magnitude even in its higher-magnitude iterations, owing to its short duration; nevertheless, the recurrence of the B motive throughout the movement brings these references higher in magnitude. C, D, and E are also reasonably strong references; I make C weaker than A due to less faithfulness and D approximately the same as C for similar reasons. E is slightly weaker than D due to the shorter interim duration between E1 and E2. Combining all of the stages of analysis produces an overall diagram like this:

²⁷ This part of the process is likely the most subjective; many different balances could be argued effectively.

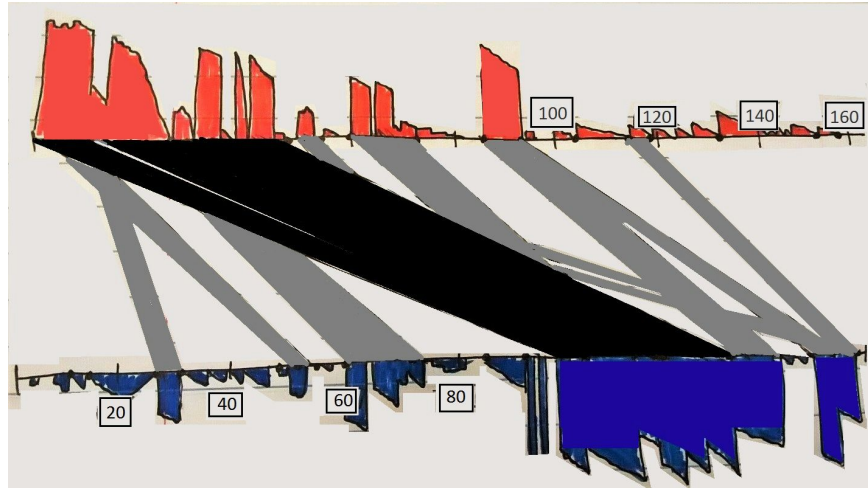


Fig. 1.15 Overall diagram for the movement

IV.4 Expanding internal timespace: inter-movement referentiality

Bartók's fourth string quartet is known for connection between the movements, creating symmetry in the overall form.²⁸ The second and fourth movements are strongly related based on melodic contour and interspersed percussive accents, somewhat related in their formal structure and use of thematic contrast as well. The fifth movement makes plentiful use of the first movement's B group as well as small sections recalling parts of the third and fourth movements. At the lowest resolution, treating each movement as a single referential block, a diagram of the piece as a whole might appear as in Fig. 1.16.

²⁸ Delcambre-Monpoël (2004), 32.

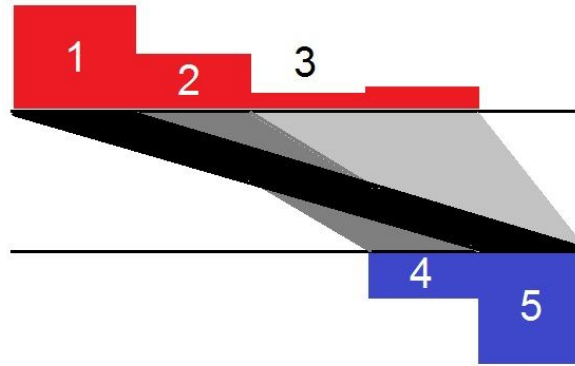


Fig. 1.16 Inter-movement referentiality for Bartók's Fourth String Quartet

V. CONCLUSIONS

A temporal reference analysis creates a road map or visual trajectory not just of the piece's material order in real time, but of the piece's relationship to itself.²⁹ In the above Bartók example, a perhaps disorienting soundscape reveals a timespace that is referential to some degree nearly throughout and, in fact, could be mapped relatively easily onto Bartók's own conceptions of the movement as related to sonata form. Fig. 1.15 shows my analytical 'performance' of the string quartet, which could in turn be expanded to flesh out the inter-movement unity sketched in Fig. 1.16.³⁰ The piece is frozen in time not as an instant of solidified ordering but as a flexible, containing timespace in which material interacts. Whereas a "being" approach might treat a repeated section as the same both times (sharing information) and a "becoming" approach might treat a repeated section as fundamentally different (*not* sharing temporality), temporal referentiality accounts for it as substantially the same and temporally distinct.³¹ In this way temporal referentiality seeks to create a

²⁹ Using Marsden's (2005) terminology for desirable properties of structural analysis, temporal reference analysis is (subjectively) derivable, meaningful, decomposable, and generative; it deliberately eschews constructivity and hierarchy.

³⁰ Burkhart (1983) addresses some strategies for performing formal structures in his discussion of Schenkerian layers.

³¹ Rahn (2004) presents "Being" and "Becoming" as two frameworks for music theory, the former constructing models and frames for interpreting music and the latter focusing on the dynamics of musical experience.

cooperative dualism, a coexistence of being and becoming. The subsequent two chapters address being and becoming more specifically in terms of substance and medium in hopes of enhancing both temporal reference analysis and the theory behind it.

Twenty-first century theories of formal analysis have balanced being and becoming in a striking variety of ways: Schmalfeldt (2011) proposes a constant reinterpretation of form as a piece progresses, a processual analysis moving through time along with the analytical subject; Hepokoski and Darcy (2006) work from an intentionally flexible set of norms and terms as a point of departure for interpreting diverse sonata forms. In this sense, temporal referentiality constitutes my contribution to the continuing search for an experiential model of musical form, an attempt to capture musical events in a static state of becoming within a piece as an extended moment.

CHAPTER II

TEMPORALITY AND MEDIUM

Thus far, I have primarily discussed music as an analytical subject without considering its validity as a *subject* of any sort. Treating a piece of music as an entity constitutes somewhat of a philosophical quandary. An entity suggests a being, perhaps an object, while music slips through performers' bodies, listeners' ears, and the fabric of time. A sizable question for a music theorist or analyst is whether a temporal happening can be treated as or interpreted under the assumption of being an entity. This quandary is well captured by Heidegger (1972), who notes that Being is not itself temporal but yet is determined by time as presence. Time and the temporal mean what is perishable. When a musical performance ends, is the audience applauding something that does not exist? If Being is not temporal and time is not a being, what is a piece of music?³² It would seem that a musical entity is made up of its Being and its course through time. It possesses some substance that constitutes its Being, and it occupies a temporal medium.

An analysis of musical form must account for musical content or substance (its Being) and how it interacts with its temporal medium (its becoming). Without its substance, music would simply be an experience of time relationships; without its medium it would simply be an abstract or static object of sound, such as the idea of a major chord. Likewise, formal analysis neglecting substance would simply speak to the progression and development of ideas with little regard to what these ideas are, while formal analysis without medium would merely address the sound structures present without regard for their organization in time. Realistically, most analyses of musical form probably involve a balance of being and becoming. The principal concern regarding medium is how to (or whether it is

³² Heidegger, Martin (1972), 3.

possible to) capture “becoming,” the temporal extension of a musical entity, in a temporally static and cumulative analysis.

Temporal referentiality aims to account for the organization in time of musical substance. In some sense, Chapters II and III address the temporal and referential aspects of this way of thinking about music. What are the implications of musical form with respect to time? How are references established in different ways in the duration of a piece? The intertwined and analogous pairs of substance/medium, Being/becoming, and reference/temporality guide the scope of this project analytically and theoretically. I advocate for analyzing, as well as listening and performing, in ways that seek to balance the phenomenological experience of moving through time with a piece as well as the forward-and-backward familiarity usually prerequisite for presenting the piece to others. It is my hope that exploring the possibility of musical tense both in general and in the Brahms analysis will provide a means of “listening” to formal structures. By expanding the options for what constitutes model composition, one could potentially open up a multitude of new avenues for interpreting form and music.

In this chapter, I focus on various implications of time as the medium for musical entities. Section I begins with an introduction to different types of entities, followed by a discussion of familiarity versus unfamiliarity in the analysis of form. Section II, “Navigating in Medium,” presents bounded and unbounded time as analogous to Chapter I’s internal and external timespace, respectively. This section explores how one might listen to and analyze music in bounded or unbounded media, connecting these techniques to Cone’s (1977) conceptions on cumulative readings of a text and suggesting an “omniscient memory” as a potential alternative to phenomenology’s protention and retention. Section III takes the “reading” analogy further by reconceptualizing orientation in terms of linguistic tense, expounding differences between musical and textual tense. Section III also includes ideas for visualizing tense within musical media as well as implications of tense in analytical methods.

Section IV applies these new techniques to construct a temporal reference analysis of the first movement of Brahms's Violin Concerto, including in the process a possible construction of a "model prose composition" or linguistic analog to musical form for this movement.

I. INTRODUCTION

I.1 Entities in media

What does medium entail in the context of different types of entities? Without substance, there is nothing by which to identify or distinguish an entity from others in the same medium; without medium, there is no way for substance to be expressed. For the purposes of this study, medium constitutes a physical or literal space in which substance exists or is expressed. As elaborated upon below, media may be treated as bounded or unbounded; regardless of the presence and clarity of these boundaries, they must be defined to some degree to restrict and identify the entity. For a purely physical entity, the medium could be said to be spatial: a physical form for a physical construct. One can imagine entities occupying different media: semantic, conceptual/abstract, or, in the case of music, temporal.³³

A temporal medium occupies a specific duration of time rather than a locus of meaning or physical dimensions. Problematically, time is also the medium of change, making it difficult to assemble a static, entity identifiable to human understanding. Human experience seems more suited to phenomenological approaches which focus on the present moment as it moves forward in time. This type of experiential approach does not require any specification of an entity's boundaries. Phenomenology and related approaches stem from

³³ Schuijjer (2008) also discusses pitch class sets conceived of as entities.

the counterintuitiveness of discussing an entity whose form is dependent on the passage of time, since such an entity would not be entirely perceptible at any given moment as would a semantic, conceptual, or physical entity. Change through temporal extension is a fundamental part of this type of entity's form and identity. By contrast, to examine form or referentiality within a temporal medium requires unrestricted movement in time, treating it as a space to be navigated. By way of developing a means of approaching form in a nonphysical, temporal medium, I propose a series of examples to better grasp the substance-medium concept of entity.³⁴ How might medium be conceived for other objects?

Example 1: Sculpture

A sculpture is a tangible object in a physical medium, generally with distinct, sharp physical boundaries where the medium ends and the surroundings begin. Sculpture requires a humanly executed process to come into being, but its identity is the static result of this process rather than the process itself. Sculpture is not an event; it does not have a duration in any practical sense. Its medium is visible, touchable, and atomically definite; its form is intuitive. A sculpture is physically substantive and temporally static; its identity does not change once it has come into being.³⁵

Example 2: Architectural drawing

Similar to a sculpture, a building is a humanly conceived and realized physical construct, occupying a physical space. A building is also temporally static, its identity encapsulated in its state at any single moment after its completion. What of this physical entity yet to come into being? Imagine an architect's detailed, comprehensive plans for a

³⁴ I mean that musical entities are nonphysical, not that there are no physical components of musical performance and listening.

³⁵ This is not to say that sculptures do not change over time; however, their "lifespan" is considerably longer and practically infinite relative to the durations of the music considered here.

building. Although the plans may eventually be realized, the process of the entity's construction—now in the future rather than the past—is still irrelevant to its identity. This object is still temporally static; its medium would seem to be conceptual and abstract despite the substance being physical in nature.

Example 3: The word “egg”

Substance and medium would seem to grow less intuitive as entities move farther from physical media. As an example, take the word “egg.” Like an architectural drawing, this word is evocative of a physical object, a physical substance. Its medium could be semantically abstract; the word itself is not strictly physical. Once more like the previous two examples, “egg” would be temporally static in that its meaning does not require a temporal process.

Example 4: Cave formations

All three of the former examples concern humanly constructed and temporally static entities. A long-term natural formation, such as a stalactite or stalagmite, definitively constitutes a physical substance. Unlike that of sculptures, buildings, and nouns, I would allege that the identity of a stalactite cannot be encapsulated in a particular moment of time. Rather, part of a stalactite's identity is in the process of its formation and in its gradual change over many years. In this sense, a stalactite could be framed as a physical entity in a temporal medium. One could reduce a stalactite to a static entity, its manifestation in a particular frozen “slice” of time, but to do so would lose a significant aspect of its formal identity; I posit that the same is not true for sculptures and buildings, which seem to be entities of physical substance in physical media. It would be strange to look for a cumulative moment at which a stalactite reaches its static identity.

Example 5: Humans

Strangely, a human life has much in common with a stalactite in that I would argue it is a physical substance in a temporal medium. Someone's identity is located at least partially in the processual aspect of life, the change of personality across the span of time between infancy and death. The identity of a human differs from that of a stalactite in that—aside from the obvious difference of conscious life—human life has a more definite beginning and end. For each life, there exists a somewhat defined span of time for which one could say the person is alive.³⁶ Humans live in a temporal medium, roughly representable with a duration of time bounded at both ends.

Notably missing from this eclectic collection of entities is an example of an abstract substance extended in time. Independent from physical objects taking shape, music entails some sort of sound-concept substance in a temporal medium. As expressed more briefly in Chapter I, temporal referentiality aims to provide a means of directly addressing the temporally extended aspect of musical form. This abstract, “four-dimensional” nature of music requires a concept of form that is simultaneously static and processual, able to capture the whole of a piece as an entity while also accounting for its temporal extension. Process, change, and relationships in time must be treated as part of a musical entity. Musical entities and their forms could be described as “becoming beings” in that they can be identified and even bounded as unified substance, but that this substance exists only from a perspective distributed across time. To ignore the temporal extension of music in examining its form is to present the equivalent of a two-dimensional representation of a three-dimensional object, e.g. a circle in lieu of a sphere. Humans may experience time as linear and thus be unable to hear a piece of music as they might see an object, but by incorporating the passage of time

³⁶ For simplicity, I am not addressing the ethical complex that includes issues of where human life begins and conditions of gradual mental deterioration.

into analysis it becomes possible to suggest an additional temporal dimension in a three-dimensional space, as if shading in a circle so as to suggest sphere-ness.

I.2 Familiarity and medium

Discussing problems of analytical time, Brubaker (2009) poses the question, “How can a pre-written text mimic or signify life experience where the future actually is unknown?”³⁷ Yet, analyzing the form of a piece would seem to imply a certain degree of familiarity with the entity. Typically, for an analysis of any kind to be complete, it needs a retrospective component—in real time, the analyst knows the piece and has produced a representation of some combination of its medium and substance, its “becoming” and “being.”

Different types of analysis assume different amounts of familiarity. Whereas some analyses lean toward becoming, proceeding in a way that suggests the analyst is unfamiliar with the subject and processing the piece in real time, other analyses jump around in time, framing events in terms of others which may not have happened yet. Temporal reference analysis, like many analytical methods, seeks a balance and a coexistence of familiarity and unfamiliarity; in other words, I hope to analyze relationships across the temporal medium while attending to events’ relative positioning and the temporally extended nature of the overall entity. On the subject of familiarity in analysis, Cone (1977) proposes an analogy to three readings of a detective story: a first reading/hearing which is purely experiential (becoming), a second hearing which actively processes the now somewhat familiarized content (being), and a third hearing which is a “double trajectory” of experiential and analytical interactions with the subject.³⁸ I find myself as an analyst most drawn to Cone’s

³⁷ Brubaker (2009), 147.

³⁸ Cone (1968), 558.

third reading, which combines the first and second into an experiential-analytical hybrid, appreciating the subject as a “work of temporal art.”³⁹ Temporal reference analysis, like this third reading, is intended to be somewhat performative in nature, portraying familiar events as novel and conceptualizing the analytical second reading in terms of the experiential first.⁴⁰

Employing Cone’s terms, analysis would be difficult if not impossible on the first hearing,⁴¹ just as it might prove difficult to capture long-term formal relationships in a purely experiential stream-of-consciousness phenomenological analysis. A being-focused analysis looks at relationships perhaps without regard to their temporal situation or orientation: This style might be analogous to the “second hearing” in which the listener consciously or unconsciously evaluates patterns, interrelationships, and event structures, freely jumping around within internal timespace.⁴² In temporal reference analysis and in the third hearing, though the piece is “read” in its chronological order, presented as it is situated in its temporal medium, the admittedly familiarized reader sees characters as who they are over the course of the story and events as how they relate to the rest of the plot. An analyst most likely has complete familiarity with the substantial relationships in the analytical object’s medium: informational and temporal relationships in internal timespace with respect to external timespace.⁴³ Familiarity is admitted, assumed, and not mutually exclusive with movement through time.

³⁹ Cone (1968), 559.

⁴⁰ Cone (1968), 563.

⁴¹ Cone (1968), 565.

⁴² Cone (1968), 557 “[O]nce one has glimpsed the structure underlying a recounted series of events—the pattern of their causes, their interrelationships, their outcome—one’s consciousness of that pattern is bound to inform subsequent readings of the narrative. What I call the Second Reading ... is controlled by that consciousness. ... Mystery and suspense are banished from this reading, which admits of no emotional involvement on the part of the reader. ... In one way the Second Reading is not a true reading, ... for the reader, far from concentrating on the text before [them], is constantly comparing what [they are] being told with what [they] know from [their] previous encounter. [Their] mental activity can thus be more accurately described as thinking about the story while using the text as a means of ensuring accuracy. In a word, the Second Reading aims at an analysis—not necessarily a conscious analysis, formally constructed, but at least one implied by a synoptic overview.”

⁴³ Heidegger (1972) writes, “We represent time—the unity of present, past, and future—in terms of the now” (11).

With familiarity as a defining aspect of analysis, a piece becomes somewhat indivisible as an entity, since a full analytical understanding of a section becomes impossible without placing it in its internal temporal context.⁴⁴ Starting at the beginning without keeping in mind these events' relationships with later material would be meaningless by this methodology. Since free movement around in real time—for example, familiarity with the entirety of one's own life—is impossible for human experience, this juxtaposition of the extended and static in temporal referentiality is perhaps the closest thing possible to a four-dimensional perception of music.⁴⁵ The question remains, however, of how to construct a “third reading” and how to employ familiarity in analysis. The matter of defining what “section” of a particular medium is subject to analysis affects the way that familiarity functions.

II. NAVIGATING IN MEDIUM

II.1 Drawing boundaries... or not

I use “boundedness” to refer to the restraints defining a particular medium. Whereas an entity such as a sculpture might occupy very clear dimensions of its medium, other entities may be less clear, such as the temporal boundaries of a cave formation.⁴⁶ The presence of boundaries within a medium limit the analytical subject to a defined range of familiarity. Defining something as a piece of music distinguishes the entity from the endless

⁴⁴ Taylor's (2011) accounts of cyclic form between movements and Feld's (2005) “orientation” also suggest that a complete analysis depends on an understanding of material in dialogue with other material.

⁴⁵ Ironically, four-dimensionality as approximated by three-dimensional familiarity would seem to require the entity to be in the past, since this is the temporal orientation most freely navigable by human perception. Memory is less necessarily ordered than the present or the future, making it a more fluid territory for navigation.

⁴⁶ Jilk (2003) posits that entities are not really separated from the rest of existence, but can be objectively divided using epistemological processes. It is with this concept in mind that I divide musical entities and speak of their beginnings and ends.

flow of unbounded, or external, time and restricts the analyst's attention to a bounded internal medium, a considerably tidier frame. The analyst becomes a narrator of sorts, escaping "to the outside" of the musical entity and using this temporal frame "to control its dangerous energy." With that in mind, musical entities are still temporally extended within their boundaries; analysis cannot occur without some experiential reliving of the events in the timespace.⁴⁷

By timespace I mean a portion of time specified or left unspecified by boundaries.⁴⁸ Each musical entity could be treated either as unbounded in the endless forward flow of time that constitutes real human experience, or as bounded in its medium by beginning and end, with all the substance in between confined to the resulting internal timespace. I imagine Cone's first reading taking place in the unfamiliar, unbounded, and external timespace;⁴⁹ the second in the inter-referentiality of familiar, bounded, and internal timespace. A third reading might require both internal and external timespace to showcase how references disrupt, but also how they are situated in, the experiential flow of time.⁵⁰ I frame the remainder of this section in terms of unbounded/bounded media or external/internal timespace.⁵¹

⁴⁷ Abbate (1989), 228. For more about narration particularly in regards to tense, see Klein (2004).

⁴⁸ I use "timespace" instead of "spacetime" to differentiate this theory from a scientific approach but also to foreground different elements. "Spacetime" is a term used to refer to the physical world, which takes up space and has a humanly invisible temporal dimension. Space constitutes the primary medium, whereas time is treated secondarily based on its effects on objects in space. As human beings, we can affect our space, but we cannot affect time. "Timespace," by contrast, suggests a primarily temporal medium with an invisible spatial dimension. I find this connotation much more suitable to musical entities. Heidegger (1972) employs this term, explaining that "Time-space [does not mean] merely the distance between two now-points of calculated time [e.g. the space between two times]... time-space now is the name for the openness which opens up in the mutual self-extending of futural approach, past and present" (14).

⁴⁹ Mellor and Lucas (1998) use something similar to external timespace as support for tenseless time, arguing that there can be no future/present/past without a defined beginning to the flow of time (32).

⁵⁰ Though this study uses the three "readings" and their corresponding timespaces as the basis for analysis, these concepts could just as easily be employed for composition and performance. For a discussion of notions of "transcending" timestreams as used by composers, see for example Crispin (2012).

⁵¹ This duality has been captured by many scholars: see Kramer's (1988) linearity/nonlinearity, Reiner's (2000) objective/subjective or physiological/psychological time, among others.

II.2 Unbounded listening and analyzing

An unbounded temporal medium would be that of time in the universe, the irreversible forward-marching of human experience. This real time, external timespace, would be indefinite, its fleeting present perpetually on the move. The unbounded medium equates to a timespace of before and afters. Given a directionless memory, external timespace allows context beyond the scope of a piece: historical context and relationships to other pieces, all located in the same unbounded medium.⁵² Expanding referentiality to all external timespace would create an infinite network of connections between all events that have ever occurred or will ever occur in time: an exploration of all time. In a practical sense, however, even the section of unbounded time overlapping with one human life could not process all the events within it. Rather, repetitions or linked experiences would be processed perceptually, as different sections of timespace framed in terms of memory and expectation rather than in terms of each iteration's relationship to the others. This peak of focus at the present moment, with memory and expectation fuzzily defining either side, is the basis for phenomenology.

Phenomenology posits the concept of a “stream of nows,” or a stream of the present. Every ‘now’ is conceived of as in its own context, interacting with its own past and future. Phenomenology’s ‘now’ interacts with the past by retention (related to memory) and with the future by protention (related to expectation). As one moves horizontally through time along the series of now points, the previous ‘nows’ sink into the past. The ‘nows’ yet to come remain uncertain—human experience cannot perceive events above the horizontal line, but rather can only predict and expect. In both the past and future directions, as any particular musical event moves farther from ‘now,’ it would seem to fade away, replaced by

⁵² For example, an external past reference would share material or ideas with a previous piece in the stream of real-world time; an external present reference would share material or ideas with a piece created after it. Taylor (2011) extends referentiality to larger forms such as movements and song cycles.

more immediately relevant ideas on either side of it. Time becomes a field of metaphorical vision, with attention and focus in a small area and the remainder relegated to the periphery. In this way, phenomenology recreates perceptual experience, treating music as a stream of consciousness based on memory processing abilities and connection between different ‘memories.’ This approach is a realistic way of dealing with the unbounded vastness of perception: It is impossible to be truly ‘omniscient’ within an unlimited timespace. Phenomenology and other processual bases for analysis constitute a “first reading” of the subject without assumed familiarity: Everything is novel, flowing by the analyst who has chosen to position themselves in the present.

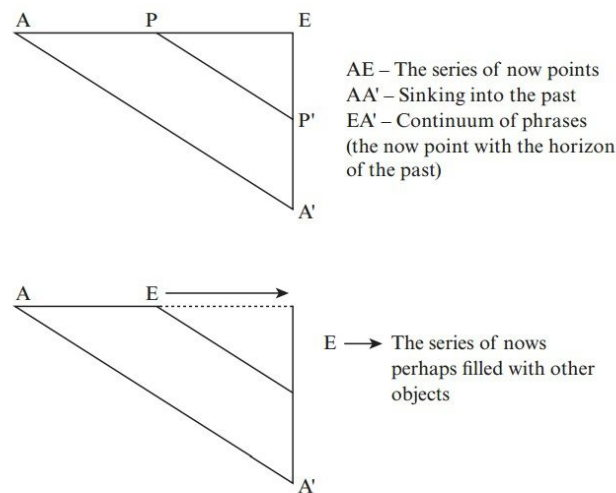


Fig. 2.1 Mensch's phenomenological visualization of the passage of the present down into the past

Temporal referentiality borrows some terminology from ‘unbounded’ approaches such as phenomenological studies, but is not based in perception. It exchanges the authenticity of the human ‘now’ for a more complete knowledge of a particular timespace at any given ‘now’ within it. Temporal referentiality abandons true memory and expectation,

protection and retention, in exchange for unlimited reign over substance past and future. In short, it mostly deals with analysis in a bounded medium.

II.3 Bounded listening and analyzing

Whereas protection and retention cannot be exact inverses due to the differences between memory and expectation (events in memory have supposedly already occurred), familiarity or recognizability does not fade with increased distance from ‘now’ in temporal reference analyses. References are “remembered” not only when past-oriented, but also when future-oriented; temporal referentiality’s ‘memory’ is free from the confines of unidirectional time.⁵³ By capping both ends of a section of time, I imagine memory and expectation diffusing into the confined space, the period of focus expanding to include the entire internal timespace instead of simply the surrounding area.⁵⁴ Familiar analyses, second and third ‘readings,’ require a bounded medium.

This bounded temporal medium is the timespace of relational processing. A pure being analysis might completely disregard the flow of real time and any context beyond the piece’s beginning and end. Sections of sameness in internal timespace would be processed as if simultaneous; sections look ahead and behind to create a new, complex chronology for the timespace. *What are the substantial relationships within the boundaries? Where else do I hear this particular section of substance?* This reading ignores time almost completely, focusing on

⁵³ The future remembered is not the same thing as the future anticipated or expected, as treated in phenomenological diagrams. Whereas phenomenological futures are uncertain, this future is quite certain, remembered before it happens in the way that one remembers the past in real time. Omniscient memory destabilizes a natural privileging of the past in real time. See Kramer’s “forward and backward listening” (168-169).

⁵⁴ One analogy for this metaphorical “diffusion of memory” is light: In a large space, light appears concentrated at its source and fades on either side. In a completely enclosed space, everything is more illuminated because the light cannot escape.

apparent familiarities and connections across time.⁵⁵ A temporally referential third reading, on the other hand, treats the bounded timespace as extended within its boundaries. I would suggest that such a hearing is becoming (temporal) and being (referentiality), temporal and experiential, listening and hearing, characterized by an enriched perception of the flow of time.⁵⁶ One hears a reference both as it sounds in real time and as its connection to the remainder of the material within the boundaries.

With temporal referentiality, form is determined based on relationships of sameness between different points on the linear time axis, representing the flow of external time.⁵⁷ The aim with this analytical method is to provide a means of representing areas of sameness as they relate to each other across the flow of real (as if unbounded) time, both visually and (as will be addressed below) linguistically. The network of relationships from both a being-focused second reading and a becoming-focused first reading could collectively highlight the fabric of sameness-difference relationships between events relative in time to themselves. In other words, the external timespace serves as a stream of anchor points to be disrupted by interactions within the boundaries of time: When an event or section occupying a space in external, real time possesses a degree of sameness with respect to another event, it is seemingly present in two or more moments in time simultaneously. External timespace,

⁵⁵ This notion of shared traits within temporal boundaries as the basis for temporal referentiality might fall under Bublitz's (2001) category of "cohesion" as a type of connectivity relationship: the linking of "current items with preceding or following ones by lexical and structural means" (155). He distinguishes cohesion from coherence, which depends more on individual interpretation and cognitive categorization.

⁵⁶ Cone (1968), 564.

⁵⁷ A minor issue arises in how to properly connect external and internal timespace. As a piece occurs, external time passes at a theoretically constant rate in countable units such as seconds; internal time passes at a slightly different rate, for example, in measures or beats. In some cases, the time measurement of external and internal timespaces may be almost identical, depending on the consistency of the performance tempo. It may make analytical sense to construct a visual diagram based on measures, beats, or internal landmarks within the piece, as do I here; employing internal landmarks certainly renders visualization more consistent between different performers' renditions. In an ideal sense, however, measures would be replaced with a more external unit of measurement in order to decenter the score and expand the possibilities for analysis.

unbounded experience folds back on itself, creating referentiality across time and evoking parallel timestreams, in turn creating form.⁵⁸

This strengthened hybrid of expectation and memory in internal timespace could be called *omniscient memory*.⁵⁹ An omniscient (=assumed total familiarity within and across bounded timespace) memory is not truly memory, but rather a mental construction of the presence and magnitude of sameness between sections.⁶⁰ A full temporal reference analysis involves not only the small-scale foreground referentiality of a section, but also the relationships to all other sections within the full span of a piece's internal timespace, erasing the privileging of any temporal orientation over another. In a bounded internal timespace, all events can be conceived equally in terms of all others. Omniscient memory works forwards and backwards, navigating the bounded medium freely. Rather than constructing the past and the future in terms of the present as would a first reading, temporal referentiality operates by constructing the present in terms of the past and the future.

Because of the 'omniscience' component, omniscient memory has no direct analog to forgetting. In fact, nothing within the internal timespace would be treated as forgotten, given that all events would ideally be processed in terms of all other events. I do not mean this "forgetting" as perceptual, but rather as an active judgment by the analyst as to what is important enough to "remember" on a larger scale visually and/or conceptually.⁶¹ One may identify some of the substance, however, as nonreferential, with no detectable amount of sameness with other events. The added referential layer from a familiar analysis would be no different from a first-reading: These sections possess no additional connections to other

⁵⁸ The "parallelness" of timestreams or evoked simultaneity by repetition of ideas appears both in Taylor's (2011) cyclic form and in Petermann's (2012) description of theme and variations. For more on theme and variations as temporally referential, see Chapter III.

⁵⁹ I choose memory rather than expectation as terminology because it is closer to being concrete in the human experience than expectation.

⁶⁰ Cone (1968), 565 refers to this as directly as an "omniscient" point of view. Craig (2001) also addresses omniscience with regard to the way an omniscient being such as God would experience and see time.

⁶¹ Cone (1968), 558-9 notes that the third reading can entail 'rationing what you know' and some 'intentional forgetting' on the part of the listener.

moments. A ‘nonreferential’ section could be framed instead as a ‘present-referential’ section, on the phenomenological line of ‘now’s. I imagine the linear time axis to be the motion of present-orientation; another way of capturing this orientation could be to conceive of present-*oriented* sections as present-*tense*.

III. TENSE IN MEDIUM

III.1 Orientation as tense

In Chapter I, I established four possible referential orientations: future, past, future and past, and present. At the end of the linear time axis, regardless of the events between the boundaries, one could consider the substance to have all moved into the past; likewise, all of the individual references would have fallen from the future into the past. Unlike external unbounded time alone, which consists of a past, a fleeting present, and a future—an ordered and irreversible set of categories—internal time could have much more fluid temporal orientations that may act independently and coexist. These orientations could then be read as cooperating to construct the piece’s passage through time, transferring substance from future to past and illustrating the gradual using-up of same or similar areas. The notion of relative positioning in time and different orientations of the same material is directly analogous to verb tense. If different “readings” and temporal orientations are possible for a piece, how might one construct a tensed linguistic analog of a musical entity?

Scholars in both music and linguistics both provide notions relevant to temporal referentiality as conceived through tense. Some scholars of music allude to tense through narrative; for example, Abbate (1989) notes in her discussion of Barthes’s structuralism that one can experience narrative in a musical score by sensing “resonances and associations that

could flash forward or backward, out of time, out of the story.”⁶² Linguists involved with tense, however, employ language about time reference that suggest music and form not indirectly. Declerck (2006) describes tense as a determination of temporal relations between situations, the “role of specific verb forms in a given language to locate situations in time.”⁶³ The parallel extends further into specific temporal orientations. He classifies tenses in terms of their temporal relationships within “temporal domains” or timespaces,⁶⁴ including relative orientations such as “anteriority,” “simultaneity,” and “posteriority/futurity.”⁶⁵ Temporal referentiality also includes mechanisms for multiple orientations simultaneously, which could be modeled by complex relative tenses (e.g. “was going to have finished”).⁶⁶ Temporal referentiality, incorporating the external flow of time as a reference point for time relationships across this flow, can utilize tenses to express relative and absolute time relationships.⁶⁷

Before extrapolating on how these linguistic and philosophical notions of tense might be adapted for analysis, it may be helpful to explore the implications of drawing parallelisms between tense and musical referentiality. Applying techniques of musical form analysis to text can help illuminate different mechanics of the two languages. Some of the

⁶² Abbate (1989), 226. Abbate notes that a piece can evoke the past tense externally by “invoking history, by calling upon established convention or inherited past models” (229). See also Klein (2004), 39: “Temporal shifts occur within the perspective of [a] narrative frame, implying that we are drawn into the past as if it were happening before us.” Abbate provides support for temporal referentiality with respect to form, arguing that “a long tradition of musical analysis rooted in Hanslick’s aesthetics of form would argue that *repetition actually creates structure, architecture, hence stasis: time frozen*” (229, italics mine). Finally, Bakker (2007) also notes that preserving the past requires repetition (113).

⁶³ Declerck (2006), 93-95. To Declerck, tense concerns the same relative time constructions as ‘orientation’ has in this study. He also uses the term “temporal zero point” to refer (usually) to the time of speech, analogous to the flow of external time, the linear time axis. “Tense” exists “to express the temporal relation between the time of the situation in question and an ‘orientation time,’” usually the temporal zero-point (22).

⁶⁴ Declerck (2006), 154. A “temporal domain” constitutes a set of temporally related orientation times, analogous to a referential subgroup or even a full internal timespace.

⁶⁵ Declerck (2006), 25-26. Declerck distinguishes also between absolute tenses (related specifically to the present), relative tenses (related to a particular point in time), and complex relative tenses (multiple temporal relations).

⁶⁶ Declerck (2006), 25-26. Sharvit (2003) also discusses relative relationships and ‘embedded tenses,’ see for example 670.

⁶⁷ Mellor and Lucas (1998) and Craig (2001) engage in extensive dialogue about what they call the “A series” (series of events in time relative to the present) and the “B series” (series of events relative to each other). Temporal referentiality could be said to use the A series as a reference point for the B series.

difficulty in this comparison arises from two distinctions between temporal orientations in music and in text: *attachment* and *fluidity*.

III.2 Tense attachment

In a sentence with a tensed word, the verb points toward an event or action that has already taken place. In word tense, the sentence typically signifies or alludes to something beyond its own content. McGilvray (1991) discusses tense references in terms of what is being referenced, categorizing references as “picture” or “identifying” references.⁶⁸ Events outside the textual entity are positioned in time to the reader by the tensed words. Tense in language is *attached* in that it has specific meaning; it points to something besides itself. Referential tense as I treat it here in musical entities, in contrast, is pure and self-attached only, constituting a self-reference rather than a picture or identifying reference. Musical tense in this sense is quite unlike language in that it points to another, differently tensed version of the same verb, without a required external attachment. Self-referentiality or lack of attachment is a way in which language tense allows for more complexity, more meaningful allusions to different points in timespace. One could assign semantic meaning to musical units, but such speculation lies outside the scope of this project.

III.3 Tense fluidity

Whereas musical tense does not easily facilitate attachment, language tense permits a lesser degree of fluidity. Since musical tense is self-referential, here defined by sameness to itself, there is a full spectrum of past and future tenses. Language typically does not have the same means of capturing magnitude of past or future orientation based on this type of

⁶⁸ McGilvray (1991), 182.

similarity. The distinction between the strong past tense of a sonata recapitulation and the weak past tense of a four-bar segment with a minimal amount of shared material to its sibling reference is far more nuanced than the past tenses possible in language. The full sliding scale of past and future and their independent coexistence is much less easily expressed through words.⁶⁹

Attachment and fluidity present some challenges and insights in the process of adapting musical analysis techniques for language or vice versa. I allege that this analog has enough parallels that it may be possible to gain insight into a piece by framing it in terms of linguistic tense. In fact, these apparent incompatibilities between reference in both types of substance may speak to new possibilities for listening and reading.

III.4 Listening to and analyzing tense

Tense in external timespace might directly correspond to the chronological order of events and location in time with respect to an internal present. Before an event occurs, it is in the future; while it occurs it is in the present; and after it occurs it is in the past. The present tense moves in human experience, perpetually encroaching upon the future and expanding the set of past events. (For example, 2017 is part of the future as I write, and 2014 part of the past.) In music, a piece moves from external future to external past through an infinite number of presents. Tracking a particular instant's tense would therefore seem relatively intuitive in real time. This tense is mutually exclusive: It moves from future (“will happen”) through an instantaneous present (“happening”) to the past (“happened”).

⁶⁹ There are languages, such as Creek/Muskogee, that differentiate “degrees” of past with respect to the present. For more on the five past tenses of this language, see Martin (2010).

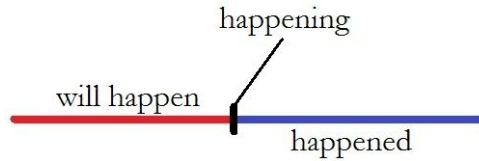


Fig. 2.2 External tense of an instant

Expanding the duration of an instant would extend the duration of the present tense (“happening”). During this extended instant, future would still become past at the same rate. This effect entails that the “happening” serves to simply blur the transition between future and past: “will happen” fades out as “happened” fades in.



Fig. 2.3 External tense of an extended instant

Treating a whole piece as an entity extended in time, a lengthened moment, extends the fading transition to the entire internal timespace. “Happening” occurs as a line between an increasing amount of “happened” and a decreasing amount of “will happen.” Widening the boundaries of internal timespace would make the piece appear as an extended “happening” once more, as in Fig. 2.3. Figs. 2.2, 2.3, and 2.4 are in fact nested structures, with the transition occurring instantaneously in Fig. 2.2.

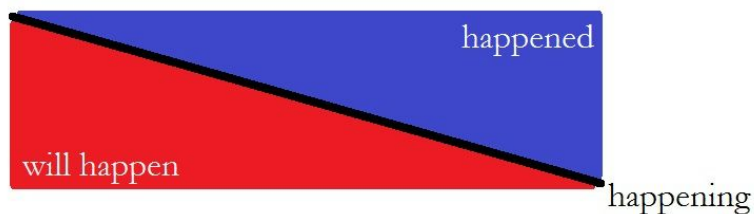


Fig. 2.4 Tense in external time of an entire piece

External tenses are absolute and simple tenses, but the “happened” and “will happen” tenses do coincide here, depending on the length of the “present” in question. Beyond the simple external tenses are the tenses of internal timespace with respect to external timespace: referential or “complex relative” tenses. What verb tense best corresponds to each of the temporal orientations established in Chapter I? A purely future-oriented referential section on the linear time axis possesses all three *external* tenses, since it may be examined from any point in real time, but it also contains an internal tense referencing a corresponding later section, which references it in turn. The internal tense of a reference must also reference its sibling iterations. In a referential pair, the former would have a future past tense (e.g. “will have happened”), indicating the current future of the iteration and its later status as past-oriented; the latter would have a past future tense (e.g. “was going to happen”). Adding more to the network requires a future past past future tense to capture the simultaneous past and future orientations: perhaps representable as “will have been going to happen.” The future past, past future, and future past past future cover three of the four possibilities for orientation; the present is significantly more simple because it corresponds directly to external time (e.g. “happening”).

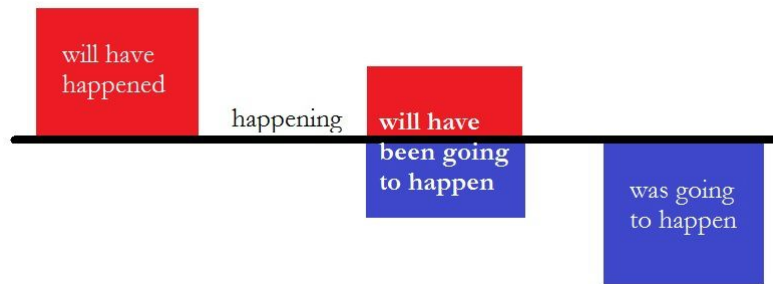


Fig. 2.5 Internal tense of a referential group

A problem arises concerning where referential sections cross through the present. If references move from a future past [to a future past past future] to a past future, it seems that there must be some present, but the only present occurs in non-referential sections.⁷⁰ The present for references instead would be manifested in the connections between iterations, distributed across all the members of a group. With external timespace folded back on itself, the presence of a reference would exist necessarily in all iterations simultaneously. This presence is in addition to the moving time experience of a “first reading.” Internal tense in tandem with external tense, complex self-relative tense with respect to absolute tense, allows for a conception of references in dialogue with one another, recounting the same material from the perspective of different points in time as a piece happens.

III.5 Tense of analysis

In a written analysis, the piece’s internal present is given a trajectory through the external past, employing a present-tense narrative of this external past or a static, cohesive

⁷⁰ In a similar vein, it would seem that internal tense does not account for the gradual transition from [future past] to [past future] through [future past past future]. One could add more complex intermediate tenses to clarify this distinction, but for the current purposes it suffices to think of emphasis within the tense on past or future as one orientation subsumes the other.

framework of its contents. Earlier I addressed the matter of familiarity with a piece with respect to Cone's "three readings." It is also worth addressing how tense is incorporated into different styles of analysis. Because analysis is tinged with familiarity by the analyst, it is also tinged with past tense.⁷¹ Analyses must hold a conception of time; analysts must choose how to position themselves with respect to the movement of time in the piece. Does an analyst choose to move through time with the piece (as in Schmalfeldt's processual analyses) or provide a stable summary of its content (as in Hepokoski and Darcy's sonata framework)?⁷² In presenting and examining music as a temporally extended entity, is the analysis in question emphasizing its status as an entity—being—and/or its temporal extension—becoming? Cone's first reading might be based in the present tense, absolute tenses moving a piece from "happening" to "happened" or "was happening." This approach could be treated as a temporally extended entity itself, employing time as a medium for expressing musical form and possessing its own duration in external time. The second reading, "being" analysis, seems to be based on past tense, ignoring the moving present and addressing things equally as having happened. This analysis would be a temporally static entity.

Temporal referentiality and the third reading are strictly speaking also past tense analyses in that the material is admitted to be completely familiar, but relative tenses are constructed within the past tense to distinguish between different types of "happened." Temporal referentiality is tinged with being and becoming: a temporally static entity attempting to capture temporal extension. To better illustrate this balance as well as the complex conception of orientation as tense, I propose the following "third reading" or

⁷¹ The present considerations are also not exploring the implications of analytical process, that is, the construction of an analysis and its own requisite coming-to-being time.

⁷² Reiner (2000) categorizes these different analytical methods as "diachronic/synchronic," Zbikowski (2005) similarly uses "static/dynamic" to describe accounts of form.

temporal reference analysis for the Brahms Violin Concerto, including a potential textual analog on the movement's form..

IV. ANALYSIS: BRAHMS VIOLIN CONCERTO IN D MAJOR, op. 77 (I)

To elaborate on and expand the possibilities for the visual analytical techniques introduced in Chapter 1, I now wish to consider how linguistic tense and temporal reference diagramming can be employed in tandem to analyze a piece, in this case the first movement of the Brahms Violin Concerto. To introduce the conception of form entirely in terms of tense, consider the following model “prose composition” whose substance and linguistic tense orientations employ the repetition and sameness patterns of the concerto movement.

She'll have sat pensively in her chair, thinking about all the things that will have happened today. She'll have been on a blanket. Here she is now. She'll have sat pensively, smiling widely and feeling warm. She'll have walked up and down the stairs slowly in her sock feet. She'll have coughed briefly. She'll have felt tired. A small spider will have come out and made her jump. Spring, spring, spring, spring... A painting on the wall catches her eye. She will have been going to sit pensively in her chair, scratching my head about all the things that will have been going to happen today. She will have been going to trace the wrinkles in the blanket formed by her weight on top of it. She'll have been going to ascend and descend the stairs slowly in her sock feet. She'll have focused on the pressure of her feet against the carpet. She will have been going to cough suddenly. She'll have been going to feel slightly lethargic and exhausted. A spider will have been going to startle her and she'll have been going to shiver, chills. She will have been going to focus on her feet. She will have been going to cough abruptly. She will have been going to focus on her feet. She will have been going to cough harshly. Harsh, harsh, loud, loud, ringing out. The tassels on the rug are crooked. She will have been going to sit on a wrinkled blanket. Wrinkles, wrinkles... She had been going to notice the spider and eye it suspiciously. What is it now... no matter! She will have been going to sit pensively in her chair, puzzling and thinking over all the things that will have been going to happen today. She had been going to trace the wrinkles in the blanket formed by her weight on top of it. She had been going to walk around on the stairs slowly in her sock feet. She had been going to focus intently on the pressure of her feet against the carpet. She had been going to cough quickly. She had been going to feel slightly lethargic and exhausted. She had been going to sit pensively, smiling.

A smile now! [Monologue] She had been going to relax thoughtfully in her chair, her chair, the soft and comfortable chair. She's shifting her legs, shifting them again, fidgeting, fidgeting, and settling in.

Fig. 2.6 Model prose composition of the Brahms Violin Concerto

It is crucial to emphasize immediately that model prose composition is not intended in any way to evoke the content or programmatic element of a piece. Rather than detailing a story, mood, style, or feeling, the above paragraph models only the formal reference structure of the concerto movement. As such, the sentences correspond entirely arbitrarily to each distinguishable subgroup. Through the process of constructing this model prose composition, I intend to explore the possibility of a textual “third reading” of the movement’s form.

Due to the aforementioned curiosities of using language tense as analogous to temporal referentiality—fluidity and attachment—this model constitutes more of a starting point for new analytical methods than its more developed visual counterpart. The Brahms prose composition serves as a tool both for forcing oneself to think of the movement’s form entirely in terms of tense as well as for illustrating the effects of translating between the two media.

IV.1 Background analysis

Judging from where there appears to be the most reoccurrence of material, the largest blocks of sameness occur from measures 1-135, 146-287, and 381-512, all three of which seem to be similar to one another in terms of thematic use. Loosely, these three sections form a referential network: a concentration of future past, a stretch of present, and a block of past future. Sketching these sections yields the figures:

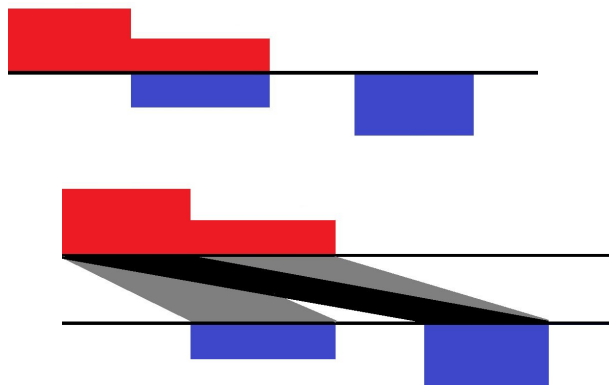


Fig. 2.7 Background analysis for Brahms' violin concerto in D major, op. 77 (i)⁷³

In text, this formal sketch would appear as two consecutive and similar units shifting from the “will have happened” tense to the “will have been going to happen” tense, followed by a section in present tense and a similar unit in the “had been going to happen” tense.⁷⁴ A prose passage such as the following would take the same form:

I am situated/doing something. I am situated/doing something.
[Other substance, other substance.] I am situated/doing something. [Other substance.]

Fig. 2.8 Background text analysis

Processing the relationships between sections of the music would remodel the text as being tensed, shown in Fig. 2.9.

I will have been situated/doing something. I will have been going to be situated/doing something. [Other substance, other substance.] I had been going to be situated/doing something. [Other substance.]

Fig. 2.9 Tensed background text analysis

⁷³ Traditionally speaking, these diagrams seem to indicate a background form compatible with a double-exposition sonata (concerto) movement, with the solo exposition longer than the orchestral exposition, a development section, a recapitulation, and a coda.

⁷⁴ Note the use of “had been going to” rather than “was going to”; I make this change in order to evoke tense rather than intent, as might happen with “She was going to...”

When listening at a background level to the form of this movement, the “reader” would simultaneously process the stream of present (“I am interacting...”) with the stream of referential tenses (“I will have... I will have been going... I had been going to...”); in other words, the concurrence of first and second readings produces the third, which reads form both in external and internal time.

IV.2 Middleground analysis

Breaking down the background further, I observe six discernable subsections, referred to here as A, B, C, D, E, and F. Though I would imagine these groups to correspond with some facility to labels of primary theme, transition, secondary (a) theme, closing, solo entrance, and secondary (b) theme, respectively, they do not necessarily correspond directly to sonata-form-style thematic analyses. My A and B might be treated as components of a larger “primary theme area,” such as in Phelan (2006), who divides his Theme I into 3 subthemes labeled IA (first half of my A group), IB (second half of my A group), and IC (my B group).⁷⁵ Phelan and Leistra-Jones (2015) both agree on the beginning of the second theme as what I have here labeled C, subsuming the D group into the secondary theme area.⁷⁶ Subsections A, B, and C occur in succession with each other three times, with A returning briefly a final time near the end of the movement. In the first iteration of ABC, the referential block is followed by D. In the two following iterations of

⁷⁵ Phelan (2006), 6-10, see also Leistra-Jones (2015), 257. Leistra-Jones groups m. 1-26 together, also treating A and B as part of the same larger section.

⁷⁶ For treatment of the C group by both authors, see Phelan (2006), 10 and Leistra-Jones (2015), 258. I divide D into D(i) and D(ii) because although the style changes between the two, they never occur separately from each other. D(ii) never occurs without being preceded by D(i). Other analyses have treated D(i) and D(ii) as belonging to different sections altogether: Leistra-Jones distinguishes D(i) as a disintegration and repetition of her “S-motive” from the second half of the secondary theme (here C group), treating D(ii) as an extended cadential passage (p. 258); Phelan (2006) marks D(ii) as the beginning of the closing theme, with D(i) belonging to the secondary theme (13).

ABC, F is inserted before D.⁷⁷ E is perhaps the weakest referential link; it occurs approximately three times, using recognizably similar material but never fully reiterating.⁷⁸ Also worth noting is the difference in the first iteration of B from the second and third; further examination reveals that B1 breaks from B2 and B3 after only four bars, proceeding to establish reference (A') with bars 513-525 instead. Previewing the foreground analysis, the previously unexamined present-tense block of 287-380 contains some fragmented references with B, D(i), E, and F, among other figures.

Table 1 Roughly defined subsections by letter group: note not all sections are accounted for

A	m. 1-16	D(i)	m. 69-77
	m. 136-163		m. 236-245
	m. 381-404		m. 292-295
	m. 527-535		m. 300-305
			m. 479-486
A'	m. 27-36	D(ii)	m. 78-89
	m. 513-520		m. 246-271
			m. 487-512
B	m. 17-20	E	m. 90-101
	m. 164-177		m. 272-287
	m. 348-355		m. 361-370
	m. 405-418		
C	m. 41-68	F	m. 206-235
	m. 178-205		m. 288-291
	m. 419-444		m. 296-299
			m. 445-478

For each of these sections, I arbitrarily assign verbal content to break down the areas from the background analysis. This text is more specific than the background sentence: a text about sitting thoughtfully to A and A' (in the case of A, in a chair), being on a blanket to

⁷⁷ Leistra-Jones (2015) inserts the “soloist’s new theme” (here F) into the secondary theme area (261), somewhat emphasizing its independence. Phelan (2006) treats it as IIB, part of the secondary theme absent without the soloist, which ties F more closely to C (15).

⁷⁸ Phelan (2006) treats E as the soloist’s rendition of his IA (the beginning of my A group), labeling it IA₁ (14). Leistra-Jones (2015) reads it as part of a “solo preface” from m. 90-135 (260).

B, walking up and down stairs to C, coughing and feeling tired to D(i) and D(ii), respectively, the appearance of a spider to E, and focusing on the feeling in one's feet to F. Once again, note that I have in many cases chosen textual content that may seem odd or directly counterintuitive to the music (see D(ii)) to emphasize that the *form* of the text is my sole concern for the time being.



“sitting thoughtfully in a chair”

Fig. 2.10 A group



“being on a blanket”

Fig. 2.11 B group



“sitting thoughtfully, smiling”

Fig. 2.12 A' group



“walking up and down stairs”

Fig. 2.13 C group



“coughing”



“feeling tired”

Fig. 2.14 D(i) and D(ii)



“appearance of a spider”

Fig. 2.15 E group



“focusing on one's feet”

Fig. 2.16 F group

The middleground form labeled by subsections is approximately as follows:

AB | A' | CD_ID_{II}E | ABCFD_ID_{II}E | FD_IFD_I | B | E | ABCFD_ID_{II}A' | A |

Fig. 2.17 Letter-labeled middleground form (vertical lines show non-categorized areas)

Textually abbreviated, this appears as:⁷⁹

sitting blanket [other] sitting' [other] stairs coughing tired spider
 [other] sitting blanket stairs feet coughing tired spider [other] feet
 coughing feet coughing [other] blanket [other] spider [other]
 sitting blanket stairs feet coughing tired sitting' [other] sitting
 [other]

Fig. 2.18 Middleground form represented by assigned textual parallel words

A second reading of the middleground form would incorporate tense into each subsection. Before assigning the complete sentences corresponding to each iteration present, one way of representing how the final tensed form of the movement might appear at a middleground level is to add punctuation symbols representing past (closed parenthesis), future (open parenthesis), and both tenses (hyphen). The vertical lines between letters now come to represent present tense.

A(B(|A'(|C(D_I(D_{II}(E(|A-B-C-F(D_I-D_{II}-E-|F-D_I-F-D_I-|B-|E)|A-B)C)F)D_I)D_{II})A')|A)|

Fig. 2.19 Letter-labeled and tensed middleground form

Keeping in mind this middleground layout, I proceed to the more detailed foreground analysis for examination of individual measures and construction of possible sentences for each iteration.

⁷⁹ “Abbreviation” because the middleground analysis does not yet have the necessary information to construct the full foreground sentences for each subsection’s individual iterations; I restrict myself here to words simply indicating the assigned textual parallel for each subsection.

IV.3 Foreground analysis

IV.3.1 A group

The pure past-tense iteration of the A group is considerably shorter than the previous three. A4 occurs nearest to the end of the piece, immediately following the cadenza. The melody is the same for the first six measures (m. 527-532) as the first seven or eight bars of A1, A2, and A3, after which it repeats the last two bars again before turning to locally referential material. In other words, m. 531-532 becomes a low-magnitude immediate future past to mm. 533-534.⁸⁰ A4 constitutes an outlier in comparison to A1-A3 in terms of its brief duration, which does not include the latter half of A (thus preventing a cumulatively higher degree of sameness), as well as in terms of accompanying voices: This iteration is softer and more subtle, like A1 and A2, but includes a unique accompanying chromatic line in the first violin part. Like A2, the melodic line is in the solo violin part. Although A4 registers firmly as a distinct reference to the initial melodic line of the group, its magnitude is diminished greatly compared to the first three iterations.

A3 begins with the same first 8 bars as A1 and A2, here rendered *fortissimo* with the full orchestra's texture. As in A1, the orchestra executes these first eight bars—here m. 381-387—without the soloist. A complementary line to the melody emerges in the lower voices, unique to this iteration. Another complementary figure, the series of eighth notes found in the viola part of A2, appears in full force in the violin parts. Measures 388-392 are approximately non-referential, perhaps loosely related to the figure at m. 142 in A2. Within this isolated figure, 389-390 and 391-392 seem to be referencing each other; the two subgroups do not have the same pitches, but have noticeably referential contour and rhythm.

⁸⁰ I do not note any significant internal referentiality within the first 6-8 (depending on which iteration) measures of A, although the arpeggiated melody and some straightforward rhythms could appear referential on a focused local scale.

The following twelve measures (393-404) are a strong reference to A2. M. 393-396 and m. 397-400 are referential locally to each other; either of these can be said to correspond to m. 9-12 in A1. It makes more sense to me to treat the last eight bars, 397-404, as a continuous reference with respect to A1, delayed by a local future-tense reference of four bars here as well as in A2. Within 393-396 and 397-400, the first two bars and the last two bars reference one another, creating an overall staircase effect for that span of eight bars. Measures 401 and 402 also reference each other on a local scale by pitch contour and rhythm in the melodic voices and in the solo part, as, arguably, do measures 403 and 404 to one another. I note these references on a local scale, though they do not appear clearly on the graph of the entire piece.

A2 is the longest iteration, beginning with the same first melodic figure for seven bars (here m. 136-142). In measures 142-151, A2 distinguishes itself from the other iterations with a mostly present-tense area. Measures 142-143 and 144-145 are a local referential pair based on rhythm and contour, as are measures 146-147 and 148-149. Measures 152-163 follow the same referential pattern as measures 393-404. A2 is distinct from A3 and A1 in that the soloist is present and contributes to the primary melodic line for the majority of this iteration.

A1, the beginning of the movement, begins the same way as the other three iterations in m. 1-8. It then directly proceeds to reference the last eight bars of A2 and A3 in measures 9-16, taking on the same local patterns as measures 397-404 and 156-163.

The iterations vary in referential magnitude with respect to one another. A4 is of the lowest magnitude, as this iteration does not proceed into any other material from the A group. A1 has less overall sameness to A2 and A3; A2 has the soloist present for the initial melodic block, the soloist embellishing subsequent subareas, and the longest stretch of material deviation from the other two; and A3 has a significantly thicker orchestration including complementary pitch lines in the initial melodic block. As such, I treat A1, A2, and

A3 as all having comparable magnitudes, though an argument could be made for diminishing the magnitude of any of the three. Regardless of relative magnitudes, A1 consists of a continuously high magnitude, while A2 and A3 each have a small area of present-orientation followed by a moderate-amplitude block (the extra four bars preceding the final eight in A1).

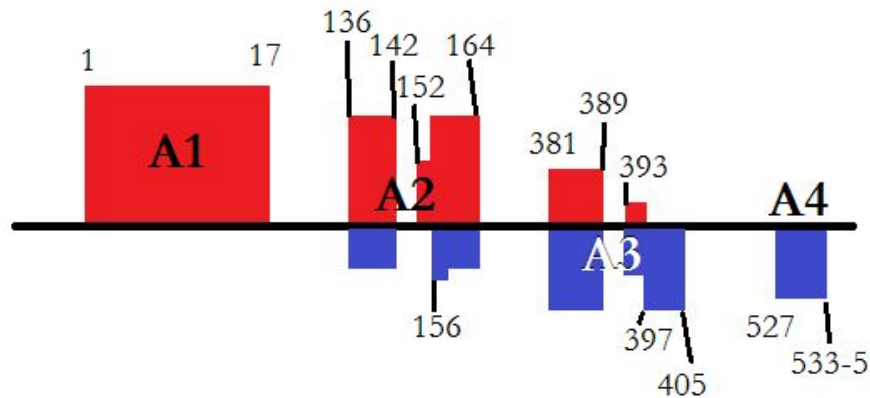


Fig. 2.20 Relative magnitudes for iterations of the A group

The figure above displays a visual representation of referentiality in the four iterations of the A group. Within a model prose composition of this movement, each sentence would need to approximately recreate the relationships between the four iterations, marking them as referential while also capturing differences between them. This process is more inexact than the graphlike visual figures, but does provoke the analyst to consider differences qualitatively and explore ways of representing difference between sentences. For the A group, I use the following four sentences:

A1: I sit pensively in my chair, thinking about all the things that are happening today.

A2: I sit pensively in my chair, scratching my head about all the things that are happening today.

A3: I sit pensively in my chair, puzzling and thinking over all the things that are happening today.

A4: I relax thoughtfully in my chair, my chair.

Fig. 2.21 Possible sentence analogs for iterations of the A group

Loosely, A4's sentence analog captures the brevity of the iteration, the locally referential material following the section's conclusion, and the uniqueness of the chromatic accompanying figure present in the violins. The connotation of "relax" and "thoughtfully" against "sit" and "pensively" is a subtle difference, but nonetheless present. Likewise, the non-referential interjections in the middle of A2 and A3 are captured by changes in the verbs midsentence. A1-A3 seem to hold approximately the same structure, with A2 and A3 adding additional words. There could be many ways of representing these differences; the most important goal being to illustrate the presence (and potentially the degree) of difference between iterations.

IV.3.2 A' group

A'2 is an 8-bar segment (m. 513-520) immediately prior to A4. The first four bars do not register an internal reference to themselves, but do overlap with the first four bars of A. The two bars following, m. 516-517, are referential to each other, as are m. 518-519. A'1 differs by only two bars: an additional measure following the fourth and fifth of A'2 and an additional measure following the sixth and seventh of A'2. The two added measures in A'1, m. 32 and m. 35, serve as an additional staircase in the two local references found in A'2.

I label this referential pair A' because it begins for the first four bars in the same fashion as A, but proceeds in a different direction. In fact, these first four bars of A'1 and A'2 are sufficient to register it as referential on a larger scale with the four iterations of the A block. This link to A could be represented in a textual parallel as "I sit pensively." The subsequent measures could appear as "smiling" vs. "smiling widely" in A'2 and A'1, respectively, capturing the additional material in the first iteration.

A'1: I sit pensively, smiling widely.

A'2: I sit pensively, smiling.

Fig. 2.22 Possible sentence analogs for iterations of the A' group

IV.3.3 B group

B4 and B2 are exactly identical to one another in terms of orchestration, pitch relationships, rhythm, and melody. The first twelve measures (405-416 in B4, 164-175 in B2) can be broken into two noticeably inter-referential six-bar phrases (although the soloist changes patterns, the harmony and bassline remain the same), which in turn can be broken into two referential two-bar figures and two referential one-bar figures, successively. The final two measures, m. 417-418 and 176-177, are loosely referential to each other. B3 is a lower-magnitude reference to B4 and B2, it has in common only the bassline pattern and differs strongly in the solo violin part. The eight-bar pattern can be broken into four two-bar segments forming a stairstep figure. B1's magnitude is even lower than B3's; it occurs only for four measures to briefly register as a reference. Comparatively, B4 and B2 function as the primary references, with only minimal sameness between B1/B3 and their complementary iterations. B4 and B2 would therefore be best represented with identical sentences, with B1 briefly relating to these sentences and B3 suggesting slightly more than B1 with an additional verb and adjective inserted. One possibility for this pattern is shown in Fig. 2.23.

B1: I'm on a blanket.

B2: I trace the wrinkles in the blanket formed by my weight on top of it.

B3: I'm sitting on a wrinkled blanket.

B4: I trace the wrinkles in the blanket formed by my weight on top of it.

Fig. 2.23 Possible sentence analogs for iterations of the B group

IV.3.4 C group

The C group is the most uniform referential group, with C1 and C2 being nearly exact copies of one another in terms of local reference structure (key area being the only distinction) and C3 differing only slightly in particular places. C3 begins with a four-bar phrase (m. 419-422) forming a referential pair with another four-bar phrase two measures following the end of the first (m. 425-428). This pair is separated by two bars referencing each other. In m. 427-428, the referentiality of the four-measure figure is joined by a local future reference to the two bars following (m. 429-430). The four bars following contain a local three-iteration stairstep pattern, here represented as two and two bars for unit simplicity. Measures 435-436 stand on their own, and measures 437-438 and 439-440 form referential pairs with themselves. The final four bars, m. 441-444, form a two-and-two-bar referential pair.

C1 and C2 follow the exact pattern of C3, but the corresponding measures to m. 435-436 in C3 are followed by two more bars to form a referential pair (see m. 57-60, 194-197). Additionally, the two referential pairs in 437-438 and 439-440 become a continuous stairstep pattern in their analogous measures in C1 and C2. C1 and C2 are also distinct from one another in the absence and presence of the soloist, respectively. C2 and C3 nearly exactly share the solo part, while C1 and C3 share a key area. As such, I render them

as having approximately the same magnitude. Textually, this approximation renders all three iterations similarly.

C1: I walk up and down the stairs slowly in my sock feet.

C2: I ascend and descend the stairs slowly in my sock feet.

C3: I walk around on the stairs slowly in my sock feet.

Fig. 2.24 Possible sentence analogs for iterations of the C group

IV.3.5 D group

I divide the D group into two parts, D(i) and D(ii), not only because they seem to be distinct sections in terms of style and texture, but also because their referential structures within the piece are different: D(i) occurs more times with a shorter duration and with more of a staircase figure than D(ii), which has fewer iterations with longer duration. Nevertheless, the two sections seem to be linked enough to constitute one overall referential subsection; D(ii) only occurs directly following D(i).

Referentiality between the five areas of D(i) is hazier than many of the other sections in this movement, partially due to the fact that D(i)1, D(i)2, and D(i)5 are very nearly identical, but slightly different in duration. All the iterations of D(i) commence with a four-bar figure referring internally to itself approximately three times. As in a similar rhythmic instance in the C group, this figure appears as a pair of two-bar references. Following this four bar figure, D(i)1, D(i)2, D(i)4, and D(i)5 continue repeating similar one-to-two-bar patterns for varying lengths of time (ranging from around two measures to six). It becomes difficult with these varying lengths and the repeating motive to determine which measures correspond to which; this is not a problem on the global scale of the movement, but I have here interpreted the remainder of D(i) loosely as a staircase pattern of varying lengths. All the iterations refer to one another to approximately the same degree, with D(i)3 and D(i)4 being slightly weaker due to their shorter duration. Textually, I present all five

iterations of D(i) with the same verb followed by different adverbs, neglecting to distinguish the difference in D(i)3 and D(i)4.

- D(i)1: I cough briefly.
- D(i)2: I cough suddenly.
- D(i)3: I cough abruptly.
- D(i)4: I cough harshly.
- D(i)5: I cough quickly.

Fig. 2.25 Possible sentence analogs for iterations of the D(i) group

D(ii) has three iterations: D(ii)3 and D(ii)2 are nearly exact copies of one another, while D(ii)1 is a reference only for the first six bars and, to a weaker extent, four more slightly later. The first 8 bars of D(ii)3 and D(ii)2 consist of two successive, distinct two-and-two local reference pairs. Following this comes a less clear eight-bar stairstep pattern derived from approximate pitch contours and rhythmic figures, the third two-bar step of which is of a lesser magnitude due to rhythmic discrepancy from the other three. Two one-and-one referential pairs also appear in m. 504-505/263-264 and 507-508/266-267. By contrast, D(ii)1's internal references consist of the first four bars' two-and-two reference pair, a less clear two-and-two pair in m. 84-87 corresponding to the eight-bar stairstep pattern in D(ii)3 and D(ii)2, and a possible one-to-one link between m. 87 and 88. As a whole, D(ii)3 and D(ii)2 are strongly referential to one another, each of them referring to a lesser degree to D(ii)1 as well. This distribution suggests that D(ii)2 and D(ii)3 should have similar sentence representations, e.g. "I feel slightly lethargic and exhausted," and that D(ii)1 might instead represent the concept more briefly, e.g. "I feel tired."

- D(ii)1: I feel tired.
- D(ii)2: I feel slightly lethargic and exhausted.
- D(ii)3: I feel slightly lethargic and exhausted.

Fig. 2.26 Possible sentence analogs for iterations of the D(ii) group

IV.3.6 E group⁸¹

E3's internal referentiality begins with a four-bar phrase in m. 361-364 paired to a similar one in m. 367-370. Within each of the four-bar phrases, the first two bars form a one-bar referential pair with one another. M. 365-366 stand alone within E3, though they are referential to E2 and E1. M. 369-370 are the future-tense measures of a two-and-two measure reference with m. 371-372.

The first eight bars of E2 reference the second eight bars, within which 276-278/284-286 form a stairstep pattern with themselves. Within E1, the first measure stands alone, after which m. 91-94 reference m. 95-98. M. 98-101 form a one-by-one stairstep pattern, after which the referential portion of the E block drops back to the linear time axis.

Between iterations, E3 begins with a two-step stair pattern not found until after the first few bars of E2 and E1. From m. 363-371, E3 references both E2 and E1, including one more bar of the accompanying dotted figure from the stairstep pattern than in the first portion of E1 and one fewer than in either half of E2. At m. 371, E3 drops back to the global present tense by proceeding to elaborate on a pattern not treated as a sequence in either of the other iterations.

E2 begins the same way as E1 (or starting in the third bar of E3); it then repeats the dotted motive three times, resulting in a global magnitude drop after the first repetition (since E1 only executes this motive once in its first half, but in E3 it occurs twice) and then a drop to the present after the second (since neither E1 nor E3 have this motive three times in the first phrase). In m. 279, the magnitude increases again by referencing the same figure in

⁸¹ One could make an argument for the E group as referential to A, as in Phelan (2006); for the purposes of this analysis I hear it as having insufficient sameness to noticeably alter the magnitudes of the A and E groups.

E3 but not E1. Measure 280 returns to full magnitude until m. 284, when the future-tense component vanishes, referencing E1's stairsteps for three bars before shifting closer to the present in m. 287.

E1 points toward the future to E2 and E3 for m. 90-94, omitting some insertions present in E2 and E3. At m. 95, the magnitude diminishes as E1 ceases to reference E3, which here deviates into a different sequence. In m. 102, E1 also deviates from E2, falling back into the present. The E group is perhaps the most fluidly interpretive among the subgroups, given the differences between the three iterations. Longer sections with extended areas of sameness avoid these difficulties; as it stands the E group is more difficult to render visually and textually. In a textual sense, I might present the same subject matter in different ways, for example:

E1: A small spider comes out and makes me jump.

E2: A spider startles me and I shiver.

E3: I notice a spider and eye it suspiciously.

Fig. 2.27 Possible sentence analogs for iterations of the E group

IV.3.7 F group

The F iterations can be divided into two subcategories: F1 and F4 are considerably longer and pertain almost exactly to each other, while F2 and F3 are brief four-bar references and also almost completely alike. Speaking in terms of text, this means the iterations should ideally be rendered as two recognizable pairs mirroring this phenomenon. Within F2 and F3, the first two bars refer to the next two bars. F1 and F4 are very faithful references to one another, save for an additional four-bar interjection in F4 (m. 453-456) repeating the previous four measures (m. 449-452).

F1 and F4 begin with the same four-bar figure as F2 and F3, which reoccurs once in F1 (m. 214-217) and twice in F4 (mentioned above). The fifth bar of each iteration contains

an approximately one-bar figure which returns for six more measures in 461-466/218-223, creating a staircase pattern and making m. 449-450/210-211 point toward said pattern. M. 451-452 and 212-213 are small references to the two measures preceding the beginning of the F group.⁸² Another, independent staircase pattern occurs from m. 467-472/224-229, after which internal referentiality ceases for four bars. The final two bars of F1 and F4 are minimal references to each other.

The sentences representing the F group should observe the sameness of F1 and F4 to one another, taking into account the extension of F4 with respect to F1; it should also note the similarity of F2 and F3. I propose the following representations for this subgroup:

F1: I focus on the pressure of my feet against the carpet.

F2: I focus on my feet.

F3: I focus on my feet.

F4: I focus intently on the pressure of my feet against the carpet.

Fig. 2.28 Possible sentence analogs for iterations of the F group

IV.3.8 Present-tense areas

Although many places in this movement do not directly or strongly reference any other places, many contain local, small-scale references. These primarily appear as staircase figures close to the linear time axis and the present tense.⁸³ Due to the minimal appearance of these sections in terms of visual representation—and the analogous unimportance of what arbitrary content to select for a prose representation—I omit specific elaboration on each of the individual sections. I also refrain from including the cadenza, since different cadenzas would alter the scheme of references throughout the piece in different ways.⁸⁴ One

⁸² An alternative approach would be to redraw the boundaries between C and F, making it easier to render this small two-bar reference.

⁸³ Within this tense framework, the linear time axis comes to visually represent a stream of the present tense.

⁸⁴ Actually, the Joachim cadenza may be standard enough as to warrant inclusion, but for the sake of a cadenza's function I omit it for the time being.

could imagine the cadenza as a dramatic monologue, likely to contain some of the words and phrases and content from other sections but perhaps more extemporaneous, less organized, and more dependent on the performer's individual tastes.

IV.3.9 Zooming out

In the foreground version of my temporal reference diagram, I treat A and C as most strongly referential due to faithfulness between iterations and significant duration. B and D have relatively high magnitudes as well, each having a long duration and moderate faithfulness with one or more iterations or sections having some notable difference. E has the lowest magnitude of the independently labeled sections; F has the lowest interim duration between its primary references as well as the smallest number of long-duration iterations and thus is comparable to B and D. A' has a short duration and only moderate faithfulness and therefore is only somewhat visible when rendered in this fashion. Sameness between the theme groups is not represented in this analysis due to its arguably relatively low magnitude compared to sameness between iterations of the same subgroups.⁸⁵ A possible graphical representation of the Brahms movement is shown in Fig. 2.29.

⁸⁵ Phelan (2006) and Leistra-Jones (2015) devote some of their analyses to discussions of inter-thematic links; see 12 and 258, respectively. Leistra-Jones also provides a fascinating analysis of Joachim's cadenza and how it relates to the formal structure of the rest of the movement (266).

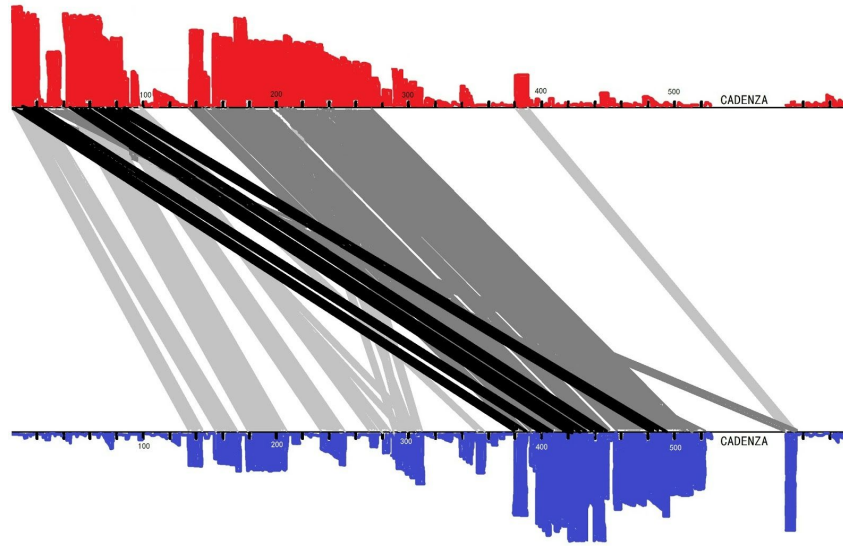


Fig. 2.29 Full visual analysis of Brahms Violin Concerto in D Major, Op. 77 (I)

As for a comprehensive prose analysis, or the complete model prose composition for the movement, I “plug in” the chosen sentences to each of their locations in the present tense for a first-reading paragraph, adding additional content in the ‘present tense’ interim sections:

I sit pensively in my chair, thinking about all the things that are happening today. I’m on a blanket. Here I am. I sit pensively, smiling widely and feeling warm. I walk up and down the stairs slowly in my sock feet. I cough briefly. I feel tired. A small spider comes out and makes me jump. Spring, spring, spring, spring... A painting on the wall catches my eye. I sit pensively in my chair, scratching my head about all the things that are happening today. I trace the wrinkles in the blanket formed by my weight on top of it. I ascend and descend the stairs slowly in my sock feet. I focus on the pressure of my feet against the carpet. I cough suddenly. I feel slightly lethargic and exhausted. A spider startles me and I shiver, chills. I focus on my feet. I cough abruptly. I focus on my feet. I cough harshly. Harsh, harsh, loud, loud, ringing out. The tassels on the rug are crooked. I’m sitting on a wrinkled blanket. Wrinkles, wrinkles... I notice the spider and eye it suspiciously. What is it... no matter! I sit pensively in my chair, puzzling and thinking over all the things that are happening today. I trace the wrinkles in the blanket formed by my weight on top of it. I walk around on the stairs slowly in my sock feet. I focus intently on the pressure of my feet against the carpet. I cough quickly. I feel slightly lethargic and exhausted. I sit pensively, smiling. A smile! [Monologue] I relax thoughtfully in my chair, my chair, the soft and comfortable chair. I shift my legs, shift them again, fidget, fidget, and settle in.

Fig. 2.30 Full first-reading/present-tense analysis of the Brahms Violin Concerto (I)

Incorporating the relative locations for each of the iterations in external timespace and the resulting tensedness of each unit produces the final paragraph in Fig. 2.6. The underlining of the text constitutes an attempt to “fluidize” past and future by emphasizing the strength of one over the other when both tenses are present. I also change from first to third person in the final reading to convey its increased attempt at objectivity, its slightly reduced experiential component.

V. CONCLUSIONS

With this two-part analysis of the Brahms concerto, I have attempted to construct two different visual listenings of it as a musical entity. Examining the temporal reference diagram highlights the distribution of past and future tenses and their fluid strengths across the span of the piece, visualizing its suitability to a general concerto form layout (three large sections of sameness indicating a first and second exposition and a recapitulation) as well as its nearly constant reliance on thematic unity. In reading the model prose composition, one can additionally perceive the difference between subgroups and match up more exactly which sections correspond to which, though the scaled distribution across the piece’s timespace is somewhat less accurately approximated by sentence length. The formal functions of the subgroups—i.e. what one labels them (IC, B, transition, etc.)—are not necessarily needed for visualizing where they return and to what other areas of time they are connected. The Brahms analysis interprets the form of a piece not only by describing it, but by transcribing it into alternate manifestations: visual and textual. Despite the initial strangeness of the model prose composition in Fig. 2.6, constructing a textual analog to the form piece of music provides a great deal to consider in terms of the nature of form. What other analogous forms might be possible?

The exclusive focus on medium and situation in time does seem to considerably limit understanding of the piece in question; Chapter II has spent very little time addressing, for example, the *content* of the Brahms Violin Concerto beyond its temporal relationships and divisions of subgroups. This concern belongs to Chapter III, which treats pieces that do not cooperate quite so willingly with temporal reference analysis as established thus far.

CHAPTER III

REFERENTIALITY AND SUBSTANCE

Chapters I and II have primarily elaborated on the temporal aspect of temporal referentiality, the medium of time in which musical substance—and consequently musical form—is constructed. The positioning of references controls how they are oriented in a bounded medium. By examining the degree to which substance refers to other substance via sameness and the distribution of this referentiality in time, it becomes possible to interpret a piece’s form as temporal referentiality through visual diagrams of past and future orientation/tense with respect to a moving present.

Chapter II included an attempt to recreate an entity’s form using another substance: text. The problem of tense fluidity, the idea that music may present any degree of past and future orientation while language has a fixed set of words for particular amounts and types of pasts and futures, poses a difficulty for such a textual transcription. Different degrees of sameness allow for distinctions in referential strength, creating the fluid temporal orientations represented as magnitude in the diagrams. This fluidity is relatively limited, however, in that it reflects only the degree of sameness as determined by the analyst rather than capturing what *makes* a given set of references the same. By visualizing and presenting only a substance’s layout in its medium, the content of a piece becomes secondary to its form. This hierarchy presents a problem, given that many scholars contend that content ultimately defines an entity and the sameness that constitutes its form.⁸⁶ As listeners, we

⁸⁶ Caplin (1998), 9: “Form concerns itself with how various parts of a composition are arranged and ordered; how standard patterns of repeated material appear in works; how different sections of a work are organized into themes; and how the themes themselves break down into smaller phrases and motives. ... More technically, the form of a musical work can be described minimally as a hierarchical arrangement of discrete, perceptually significant timespans, what has been termed the *grouping structure* of the work.” This statement is also relatively consistent with my portrayal of form in Chapters I and II.

'hear' time and relationships within a medium via the events occurring in a piece.⁸⁷ I devote my third chapter to exploring how sameness both defines and poses a problem for the concept of referentiality. I categorize sameness in terms of an entity's substance and medium; in other words, how referential areas are the same in time (e.g. occurring simultaneously, overlapping, disjointed), and what elements are the same in substance (e.g. pitch, timbre, articulation). Through filtering, or isolating substreams of substance and/or medium, I suggest that it becomes more intuitive to process *what* is being referenced and clarify an interpretation of a piece.

Following an introduction to sameness and filtering, I demonstrate different possibilities for filtering via two analytical examples: a double fugue (Contrapunctus 9 from *The Art of Fugue*, J.S. Bach) and a twelve-tone serialist theme and variations movement (the second movement of Webern's Op. 21). These examples, particularly the Webern, also call into question the analytical scope of temporal referentiality as it seeks to represent a familiarized interpretation of an entity. How "familiar" can an analyst be with the subject? Is it inappropriate to label something as referential if a familiar listener cannot hear it? In seeking to balance a more objective "being" approach to analysis with a more subjective "becoming" component, temporal referentiality is forced to confront the extent of its relevance to human experience.

I. SAMENESS

Perhaps an appropriate starting point for the expansion and adaptation of temporal reference analysis is a question: To what are these methods least suited, or to what pieces or genres might they be least insightful?

⁸⁷ Dubiel (1996) muses that hearing should in fact drive theory (and analysis), establishing relations between what we hear and the structure and context that affects it. He posits that hearing is an interpretive activity (50) and that any model is more what the listener is doing than what the music is doing (39).

I.1 Medium sameness

The analytical approach developed thus far seems best suited to account for entities with perfect “verbatim” references, or at least ones with direct measure-to-measure correspondence. Convenient blocks of exact repetition within a piece’s temporal medium make for simpler diagrams and tense structures, steering clear of issues associated with references occupying varying lengths of time—for example, it is far easier to present a shorter iteration as “cutting off” after a certain number of measures or even “deleting” certain sections present in other iterations than to account for the same substance compressed or expanded to fill different amounts of medium.

Another convenience afforded by the Bartók and Brahms analyses is the lack of significant overlap or staggering in substance. The example diagrams proposed in Chapter I address how one might handle two references that converge or diverge in sameness at different points in time, but how might one account for a single section of timespace containing two distinct references? Consider a hypothetical case in which a piece contains a reference group A and a reference group B. If any iterations of A and B coincide, should the analyst treat A and B as partial references to a single referential group AB, or treat A and B separately and face the task of how to handle their overlapping? Even more complex is the matter of partial overlap: A and B being of different durations or their onset time being staggered slightly.

Common formal models such as binary, ternary, rondo, or sonata do not necessarily account for blurred boundaries between sections. The issue commonly arises in relatively standard forms: pieces where the same substance is divided between two or more musical agents/voices and/or slightly staggered temporally, although maintaining the same

chronological order of events: in other words, canonic or canon-related structures;⁸⁸ pieces where two separate ideas later join to form a climactic or structurally important formal unison.⁸⁹ Fugue poses a particular difficulty in having the potential for coincidence of two ideas (e.g. subjects, as I will explore below in Section III) and perhaps having these ideas only partially coincide. In many cases, the aforementioned types of examples are easily heard and processed as referential by a listener familiar with the timespace, yet a temporal reference diagram or a model prose composition as explored thus far cannot express these ideas intuitively. Temporal referentiality cannot remain within its all-encompassing “magnitude” limitations of referential strength. It will prove idealistic and rigid to assume that the folds of music in a temporal medium be so neatly creased.

I refer to all of the above problems related to the situation of substance in time as medium sameness. A set of references that is medium-same is one in which there is maximal temporal correspondence between iterations and no overlap between references: Each reference occupies the same duration and with the same distribution of substance in time; this duration contains no other references. By contrast, a non-medium-same referential subgroup would vary widely in duration occupied and might share timespace partially or wholly with other references.

Substance sameness

A second problem emerges with regard to the types of sameness between iterations. Even with complex and intricate substance, it may be relatively intuitive to establish the degree to or way in which two or three referential siblings are the same. With more iterations

⁸⁸ For an example of parallel but disjointed form on a small scale, see Franck’s *A Major* violin sonata, last movement. The consistent dialogue between piano and violin makes it impossible to draw exact boundaries between structural sections beyond a ‘resolution’ of a couple of measures.

⁸⁹ See the intersection between soloist and ensemble near the end of the last movement of Mendelssohn’s violin concerto, for example.

present in a referential subgroup, however, anything short of exact reiteration poses a significant difficulty. How is it possible to capture within a two-dimensional scale of referential magnitude that, say, iteration X1 is more similar to iteration X2 but less similar to X3 and X4? Furthermore, if X1, X2, and X3 each differ from each other in specific different ways—say X1 and X2 share a mode, X2 and X3 share a meter or rhythm, and X1 and X3 share instrumentation and dynamic markings, it would seem to lose a certain degree of nuance to simply assert that all three are referencing each other to the same degree.

As I will explore in the Webern analysis (Section IV) below, the genre of theme and variations exemplifies this problem: What of thirty variations, all of which share... something? Temporal referentiality holds as a central tenet that all iterations must be considered in terms of one another, with their chronological order of appearance relevant only to temporal orientation, so it would not suffice to simply treat the theme as the central point of “sameness.” Whereas a familiar analyst/listener might conceive of each variation in terms of what may or may not be similar to other variations (e.g. “the minor one” or “the one with percussive accompaniment”), seeking universal commonalities would, to put it bluntly, remove what makes the piece interesting. Each of the thirty variations would have to be considered in terms of all others, a process which would undoubtedly lose many of the subtleties that make theme and variations a nuanced and complex genre and reduce it to a deceptively simplistic staircase. With each iteration added to a particular referential subgroup, another ambiguous staircase would bring the overall visualization closer to a heuristically fascinating but pragmatically meaningless downward slope of past and future referentiality.

Temporal referentiality, previously reliant on one stream of form, must account for form displaced and superimposed with itself. Different types, or features, of sameness can cause difficulty even if all of the pertinent iterations are completely medium-same—that is, if all iterations have an exactly discernible measure-to-measure correspondence and no difficulties with overlap. I refer to this problem as “substance sameness.” Substance-same

referential sets all have a common variable of difference, e.g. might share all characteristics save for a different pattern of articulation in each iteration; non-substance-same sets vary in different ways and make direct comparison of sameness significantly more challenging.

A confluence of medium and substance nonsameness can hopelessly ensnare the task of constructing a temporal reference diagram. To untangle the web of similarities, differences, and overlaps, I propose a system of filtering: by voice or “agent” in the case of medium nonsameness and by different criteria for features in the case of substance nonsameness. By isolating different subsets or substreams of a piece’s medium or substance and treating them separately, I hope to create a more accurate and useful visual representation of the happenings in a piece’s timespace.⁹⁰ Hearings and analyses familiar with a particular piece can and do process more than one single unified stream of form; filtering provides an opportunity to distinguish the different factors making up the strength or magnitude of a particular reference. Filtering is intended as a means of pulling apart a representation of formal relationships in some sort of interference with one another; just as one can examine “vertical” slices of a piece broken down into different sections of time, one can similarly look at “horizontal” slices dividing simultaneous events into categories. Filtering seeks to ask and answer what aspect of a section makes it referential or not, making the elusive criterion of “sameness” more concrete.

II. FILTERING

Filtering requires some strategy for the breaking down of medium or substance into more manageable substreams or subsections, grouping these parts by a logical point of

⁹⁰ Filipovic and Jaszczolt (2012) illuminate the relevant notions of grouping and extensionality, allowing multiple entities to function as one entity or experience (195-196). The idea that multiple filtered sub-media or sub-substances can converge to form one larger entity agrees with theirs, though my focus is primarily on breaking down larger entities into multiple others rather than vice versa.

division to form separate analyses and possibly even separate diagrams. This process begins with the delineation of possible groupings. “Agential filtering” may be as simple as processing different instruments as distinct timespaces, or may require some sleuthing to separate out overlapping referential groups into separate streams. Meanwhile, regarding substance-based filtering, different types of sameness simplify the content of a given musical entity, examining commonalities one feature at a time. There are potentially infinite possibilities for these filters: contour, pitch, harmony, instrumentation, articulation, instrumentation, register, timbre, etc. A third type of filter emerges in transformations of medium or substance: for example, expansion of a given duration (augmentation) or inversion of the pitch or contour features, variants of which I will employ in the Webern analysis below.⁹¹ Depending on how it is executed, transformational filtering may exceed the boundaries of what is discernable by maximally familiar listeners and analysts.⁹²

The filtering process entails that the past and future referentialities of an overall section are composed of these layered filtered subsets/substreams. A particular iteration might be in a harmonic past orientation and a rhythmic future orientation simultaneously. All of the pertinent filters collectively construct the ‘overall’ referentiality explored in the two previous chapters. The filters chosen for analysis of a given piece should be determined by what variable features produce referentiality; for instance, one would not use a pitch filter on an unpitched percussion piece—much in the way that one would not use color filters on a black and white photograph—because it would provide no additional insight. The filters given here are merely examples and by no means constitute a comprehensive list.

⁹¹ A possible analogy for substance filtering is a pair of visually altering glasses: Feature filtering would be analogous to color-tinted glasses filtering out all but one particular color, while transformational filtering might be more analogous to glasses that distort the field of vision by turning the image upside down.

⁹² Of course, “maximal familiarity” is not really evaluable and would certainly vary between informed individuals. I only mean to evoke the capacity of truly *hearing* certain effects or functions beyond simple awareness of their presence.

Without regard to the admittedly hazy and abstract limits of human experience concerning familiarity with a given musical entity, taking filtering to the extremes to discover exactly what substance is taking place at any given time could theoretically yield a full-detail representation of a musical score or recording, sacrificing the motives of analysis for the sake of precise substantial content and illuminating all possible relationships. Filtering in terms of agents, features, or transformations is not so much aimed at fully revealing *all* nuances of the substance of a piece as it is aimed at widening the scope of temporal referentiality to include more formal considerations and temporal situations of musical entities. The two analyses in this chapter and the general goals of filtering as an analytical method do not aspire so much to solve the problems of temporal referentiality as discussed above, or to process all theoretically feasible references, as to engage critically with them and explore new possibilities for analytical and visual presentations of music.

II.1 Agential filtering

Rather than attempting to average or rank two voices displaced from one another to fit them into one referential section, or attempting to account for the intersection of two referential groups in a section of time, agential filtering splits a medium stream into two or more layers to simplify the process of formal analysis. I call each of these layers an ‘agent’ to allude to their roles in bringing the overall stream of substance into being. An agential filter may separate a concerto soloist from the ensemble, a cello section from the rest of an orchestra, instruments playing the melody from those accompanying, or even a series of pitches constituting the melody within a part executed by one person. With each layer of agential filtering, the analysis moves closer to a score, categorizing ‘voices’ by instrument or substance. In fact, agents are always present at some level within a musical entity so long as there are multiple sub-events forming one larger percept—say, a chord—but these agents do

not always necessitate separate processing. Agential filtering should, if executed optimally, only serve to eliminate medium-nonsameness rather than adding redundancy by reflecting agents with identical referential patterns. In other words, though an accompanist may be executing a different type of substance than a soloist, if their events are part of the same section of formal structure, distinguishing the two for the sake of temporal referentiality is superfluous. It would be similarly impractical both analytically and in terms of hearing to filter two instruments playing in unison.

II.2 Feature filtering

Feature filtering isolates different types of substance sameness or difference in the medium without requiring any sort of transformation of said substance. This type of substance-based filtering seeks references that *share* (or differ on the axis of) a particular unaltered characteristic. As mentioned above, harmony, duration, timbre, pitch, and contour are examples of such filters. Feature filters appear to generally be audible or perceptible to the familiar analyst; for instance, once I know a piece well it is feasible for me to be able to hear instances of the same harmonic progression at different points. To refrain from embarking on an entirely different study concerning any of these features, here are some examples of maximum and minimum referentiality within each.

Suppose the following example is in question:



Fig. 3.1 Original segment

Fig. 3.1 would not require any sort of agential filtering (there is only one agent represented here), but may be broken down into many different components for feature or transformational filtering. In order for it to register as a reference with a related segment, the other segment would need to share a certain degree of a given substantial feature. The process of filtering renders a particular musical entity as only one of its elements or dimensions. The pattern of four sixteenth notes, two eighth notes, and two quarter notes becomes the entire identity of the segment through a note duration filter; its execution on the same instrument becomes its identity through an instrumentation or timbre filter; through a pitch filter it consists entirely of the sequence G-A-B-C-D-G-E-C; and through a contour filter the analysis perceives only the shape up-up-up-up-up-down-down and perhaps the specific intervals in question.

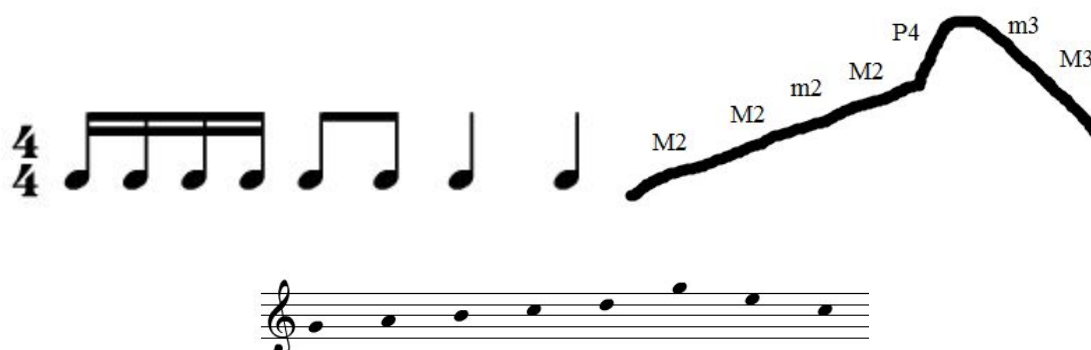


Fig. 3.2a/b/c Original segment as perceived through note duration, contour, and pitch filters

Looking at Figs. 3.2a, 3.2b, and 3.2c it is possible to see the output of three filters applied to the segment from Fig. 3.1. The following three examples are reduced in the same way to reveal referentiality or a lack thereof with the original segment, depending on the filter. Note that the pitch and contour filters are relevant to one another, meaning that they

should have correlated referential graphs for any given application.⁹³ The pitch diagram is arguably a subset of the contour diagram. Even these simplistic filters add nuance and reduce confusion with respect to the initial temporal reference diagrams—the examples below might all appear somewhat similarly on a combined, single-substance diagram.

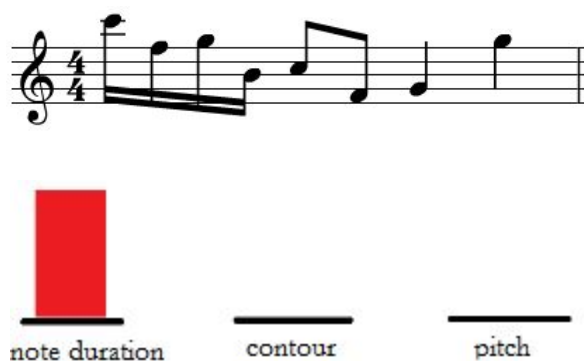


Fig. 3.3 First example, note-durally referential but not in terms of pitch or contour

The first example retains the same durational substance from Fig. 3.2a, but the sequence of pitches and the contour have little if anything in common. On the scale of a piece containing Fig. 3.3 and Fig. 3.1, only the note-duration filter analysis would display any notable referentiality.



Fig. 3.4 Second example, referential in terms of pitch and contour but not in terms of rhythm

⁹³ There are different possibilities as to how to represent pitch and contour filters. One could allege, for example, that the pitch filter does or does not require a particular order (as in a pitch class set). Fig. 3.3, for example, could register as somewhat referential regarding pitch due to the adjacency of B and C in that order. I do not register this effect, primarily because the note duration filter is a much more exact correspondence and because even a familiar listener would be less likely to process this minimal sameness.

The durational features of Fig. 3.4 and Fig. 3.2a are unrecognizable when filtered; however, removing the note durations to reveal a contour or pitch diagram renders the two segments indistinguishable. In the two examples so far, pitch and contour have behaved in tandem. The third example showcases a potential differentiation between the two.

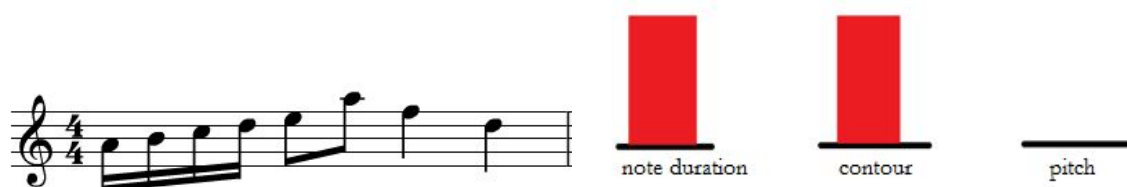


Fig. 3.5 Third example, referential in terms of note duration and contour but not pitch

One could employ filters for dynamics or instrumentation, though these elements are not present in the given example. Given that this is a simple one-measure example constructed for the purposes of this illustration, one can imagine how a more complex musical example might have many more features, including but not limited to harmonic content.

II.3 Transformational filtering

Whereas feature filtering constitutes a reduction in which elements of substance are ‘heard,’ transformational filtering relies on a function (e.g. of pitch or duration) between two references. Imagining a mathematical function, this type of filtering encompasses (substance) and $f(\text{substance})$. In these cases, in order to be a referential pair two segments must share the same substance altered in some form. Within this type of filtering, examples emerge such as diminution/augmentation, inversion, and retrograde. Diminution and augmentation filters, based in medium, are adapted to include substance “squished” or expanded into different

subsets of a piece's timespace, while inversion includes the negative version of a contour filter. Retrograde, also medium-based, is slightly more complicated, allowing for a reverse ordering of notes in the pitch and note duration filters.



Fig. 3.6a/b Both examples register as maximally referential through diminution/augmentation filter with respect to Fig. 3.1

Diminution and augmentation filtering essentially ignores the duration of substance, registering exclusively the relative proportions of the note duration. On a traditional temporal reference diagram, the connecting stripe between the top and bottom linear time axes would be wider at one end than another. If Fig. 3.1 were preceded by Fig. 3.6b and then Fig. 3.6a in some order in a piece, the diminution-augmentation filter might produce a diagram as follows:

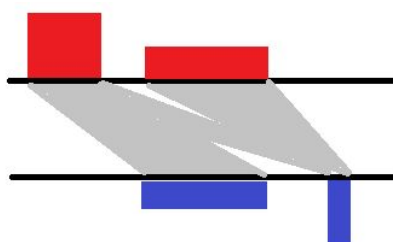


Fig. 3.7 Diminution/augmentation sample diagram

The inversion filter is a substance transformation, taking the pitch or contour filter for a given substance and marking as referential any substance with the same or approximately the same “absolute value.” Depending on the specificity of the contour, either

Figure 3.8a or 3.8b would be necessary for maximum referentiality. Once more, one could argue for or against the hearability of this filter in different contexts, or a compromise in which the referentiality of this filter compared to others' is less significant.



Fig. 3.8a/b High referentiality in the inversion filter with respect to Fig. 3.1

The retrograde filter reverses the order of the substance in the medium, applying the same “absolute value” approach from the inversion filter to the linear time axis itself.⁹⁴



Fig. 3.9 High referentiality in the retrograde filter with respect to Fig. 3.1

Retrograde connections pre-filtering can be thought of as invisible twisted stripes on a temporal reference diagram. Retrograde filtering brings these invisible stripes into view while “untwisting” them as shown in Fig. 3.10. This transformational filter is perhaps the least likely to be “audible” in any practical sense, but may still play a role in the formal structure.

⁹⁴ Whittall (1987) discusses the notion of harmony and melody as one unified space, which would make retrograde, diminution, augmentation, and harmony all parts of the same function. This idea might change some of the approaches as they are rendered here with respect to medium-based filters. For more information see 335.

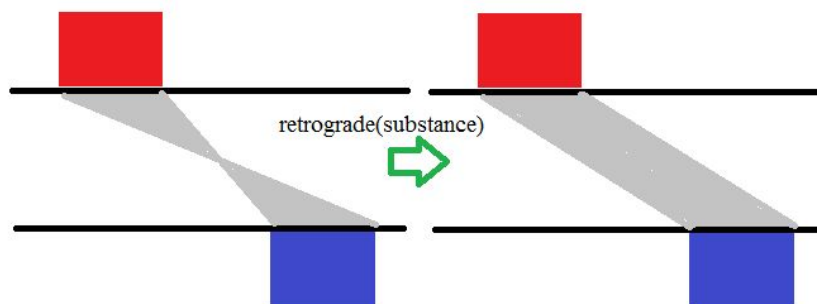


Fig. 3.10 Effect of the retrograde filter

Regardless of what an analyst determines regarding the appropriateness of a given filter, exploring the possibilities of applying filters to a given musical entity and its comprising substance makes space for substance connections within a previously ‘flat’ temporal referentiality.

Another problem remains of whether or not to simplify and combine diagrams. Ideally, diagrams would be consolidated for simplicity until doing so would obscure substantial events. In consolidating diagrams, it is up to the analyst to listen, look, and determine what elements are most formative of sameness between iterations. What is ‘hearable’ as part of the same entity?

III. ANALYSIS 1: J.S. BACH, CONTRAPUNCTUS 9 from THE ART OF FUGUE

In seeking an analytical example to illustrate the uses of agential filtering, it seems most optimal to choose a piece with multiple voices or melodic streams occurring simultaneously: in other words, a piece with highly independent counterpoint. Fugue presents a fascinating case for temporal referentiality in that employing the previously established analysis techniques would yield a somewhat non-insightful stairstep with each reiteration of the subjects, not to mention the issue concerning overlap of the two fugue

subjects. Indeed, fugue as a genre has been described as more of a process than a form, with the primary agent of form being the subject(s).⁹⁵ The process of fugue reflects much more of a cyclical time approach than a linear one;⁹⁶ rather than being well formed for a blocky temporal reference diagram or text analysis reflecting the general intuitive feeling of moving from past to future, it appears timeless in its relentless use and reuse of the subject in different contexts, unified in its continuity.⁹⁷ Fugue may prove easier to express as a being rather than a becoming entity because of its strong self-referentiality.⁹⁸

For this particular analysis, I have chosen a double fugue in four voices, a prime example of medium-nonsameness. Bach's constructions involve constant interaction of the first subject with itself and the second subject, with each of the four voices playing a unique and independent role in creating the musical entity. Substantial interactions occur not only within each voice's transition from future to past, but also between the four voices. The two subjects are, primarily speaking, the only major referential sections; aside from small contour figures, little sameness exists outside of the subjects. To illustrate more simply the interactions between subjects and voices, focusing on how best to deal with substances disjointed in time, I deal exclusively with the two subjects shown in Fig. 3.11 as relevant to referentiality in the piece. For simplicity, I refer to each of the voices by S, A, T, and B and the subjects by SUBJ₁ and SUBJ₂. One could make an argument for agential filtering by voices or subjects; I briefly discuss both.

⁹⁵ Sheldon (1990), 553.

⁹⁶ Chapin (2010), 188.

⁹⁷ Once more see Sheldon (1990), 563-566 or Chapin (2010) 188-190 and 194. Sheldon (1990) writes "If one considers the fugal process to be guided by the principles of clarity, unity, and continuity, principles not at all uncommon to the other arts of the seventeenth and eighteenth centuries, one would expect the resultant forms to show a gradual realization of the potential of mainly one subject, rather than an ordering brought about by sudden change, thematic contrast, and sectional repetition" (566).

⁹⁸ Chapin (2010) uses "being" and "becoming" (195) to describe changes in the fugue between the Baroque and Romantic periods.



Fig. 3.11 Examples of the two fugue subjects in m. 1-8 (first subject) and
73-81 (second subject)⁹⁹

III.1 S/A/T/B agential filtering

Because the subjects are exactly or very nearly exactly the same at each iteration, little to no feature or transformational filtering is needed. The first analytical step, separating out each of the voices and diagramming instances of the subjects within that voice, is straightforward.

S contains two iterations of the first subject (at m. 8 and m. 89) and only one of the second (m. 35). This distribution produces a sparse referentiality for the top voice; a diagram of only S would not register the second subject as referential at all. B is equally sparse, with the first subject appearing at m. 15 and m. 59 and the second only at m. 89. A and T, by contrast, have six total referential sections, with A having four iterations of SUBJ₁ (m. 1, 45, 73, and 99) and two of SUBJ₂ (m. 59, 119) and T having three of each: m. 22, 35, and 119 for SUBJ₁ and m. 45, 73, and 99 for SUBJ₂.

⁹⁹ In the context of 'The Art of Fugue as a whole, my "second subject" is usually referred to as the first; I number the subjects here exclusively according to their appearance in this fugue alone.

Table 1 Iterations of SUBJ₁ and SUBJ₂ in SATB by voice

Voice	Measure # SUBJ ₁	Measure # SUBJ ₂
S	8 / 89	35
A	15 / 59	89
T	1 / 45 / 73 / 99	59 / 119
B	22 / 35 / 119	45 / 73 / 99

A diagram for each voice individually scarcely merits connector stripes, given the presence of only two major referential groups. Fig. 3.12 shows the juxtaposed temporal reference diagrams for S/A/T/B. For visual simplicity, I opt for color-coding the first and second themes rather than adding connection visuals; the second subject is bracketed where it appears non-referentially within the streams of S and B. Fig. 3.12 seems to be a relatively intuitive representation of the referentiality within the piece both “objectively” in terms of representing the largest structural connections and “subjectively” in that the major areas are all hearable (perhaps even to unfamiliar listeners).

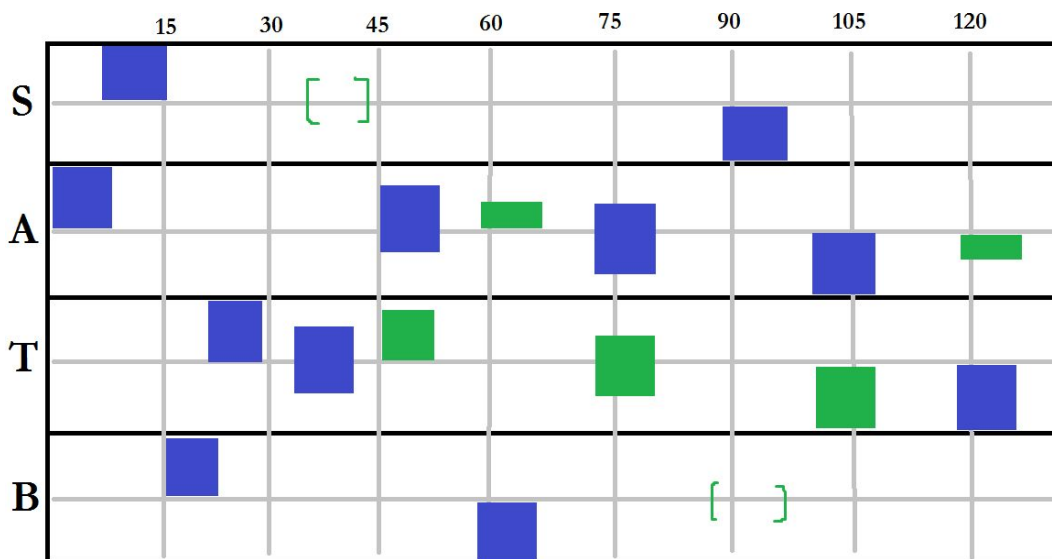


Fig. 3.12 Temporal referentiality diagrams for SATB, with SUBJ₁ in blue and SUBJ₂ in green

III.2 SUBJ₁/SUBJ₂ agential filtering and superimposition

An alternative way of filtering the fugue is to color-code S/A/T/B and create two streams for SUBJ₁ and SUBJ₂, as shown in Fig. 3.13. Assuming a hearing of all four voices together and the resulting transition of SUBJ₁ and SUBJ₂ gradually from future to past, this diagram is more straightforward in some respects; the visual representation of counterpoint between iterations and voices is reduced to color-coding rather than a staff-style distribution of the four voices.

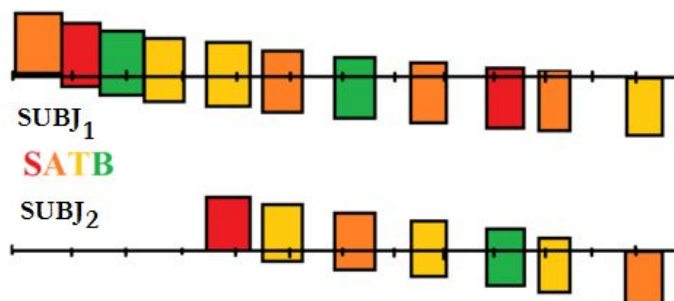


Fig. 3.13 Temporal referentiality diagrams for $SUBJ_1/SUBJ_2$, with S/A/T/B color-coded

Superimposing the $SUBJ_1$ and $SUBJ_2$ graphs provides a visualization of the entire fugue as realized by all four voices. This diagram illustrates the interaction between the first and second themes as well as which voices play a role in this execution.

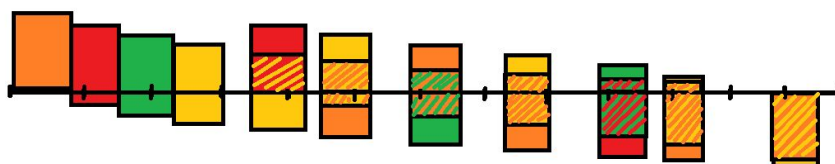


Fig. 3.14 Superimposition of Fig. 3.13, showing a potential unified diagram for **Contrapunctus 9**

There are certainly limits to how much it is possible to incorporate multiple filters into one diagram. Attempting to filter the two subjects of the fugue simultaneously with the four voices of the fugue, for instance, would result in a very complicated visual figure. Showing all of the referentiality between all of the different iterations of $SUBJ_1$ and $SUBJ_2$ would create a heavily tangled web of connections difficult to render in a two-dimensional diagram. Fig. 3.15 illustrates my attempt to capture the distribution of fugue-subject references between voices and their locations with respect to the beginnings and ends of each voice.

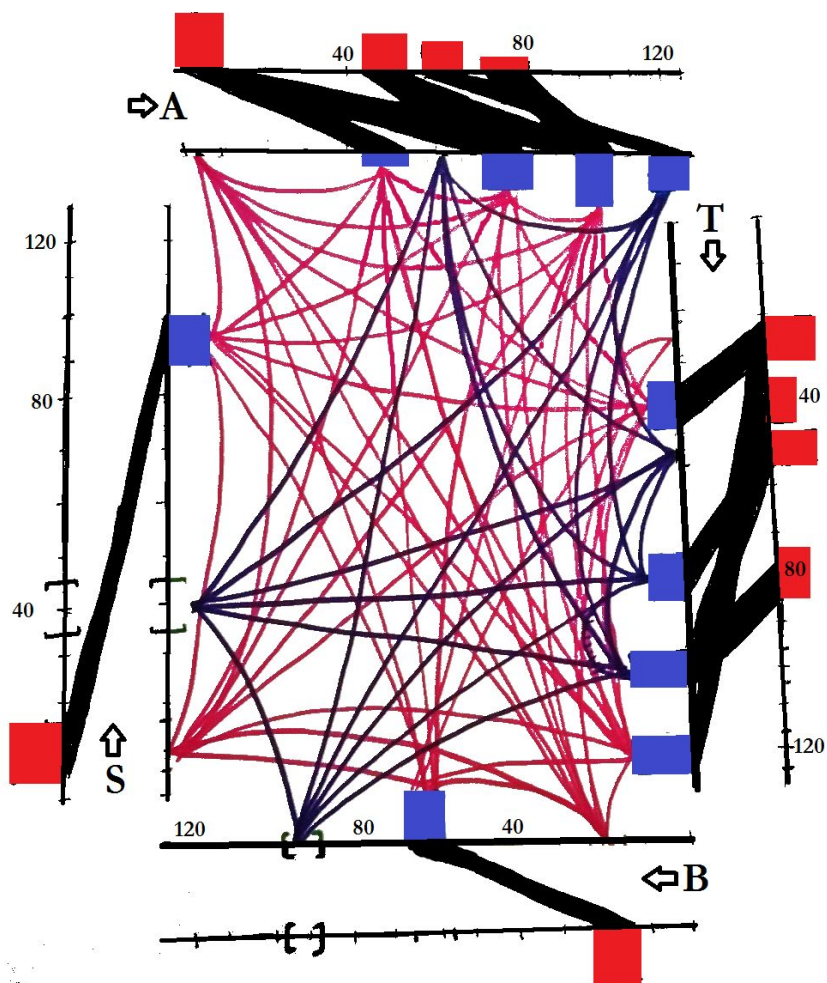


Fig. 3.15 Sketch of a possible four-sided temporal reference diagram, with
SUBJ₁ in red and SUBJ₂ in navy

Having now produced a few figures aimed at illustrating the different agents, it may be helpful to compare to the alternative, a diagram that does not incorporate these subtleties. It is still possible to render—using different colors of connecting stripes—the locations of the two subjects in the piece’s timespace, but the “flattened” or unfiltered temporal referentiality diagram is misleading: It obscures the presence of two subjects, eliminates the four voices and the contrapuntal dialogue between them, and it makes the issue of referential strength confusing—should the two subjects have an additive effect in the past-oriented

half? As complex as filtering-based diagrams may seem, they can add significantly more detail to the events within the temporal medium.

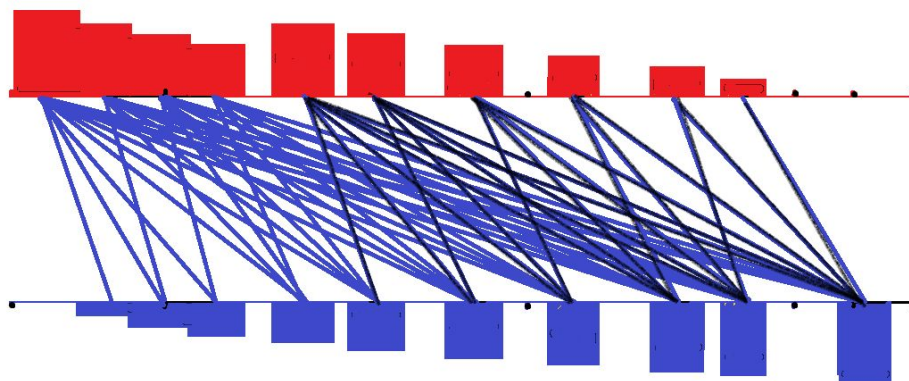


Fig. 3.16 Consolidated temporal reference diagram version of Contrapunctus 9

IV. ANALYSIS 2: WEBERN, SYMPHONY, OP. 21 (ii): VARIATIONEN

The second analysis, intended as a complement to the first, serves multiple purposes: illustrating the problem of theme and variations with or without substance sameness, demonstrating feature and transformational filtering techniques, and exploring the differences between temporal referentiality as it might be applied to tonal and atonal music. Serialism in itself poses a problem for temporal referentiality due to the structural importance placed on individual notes and the strong referentiality between parts of rows, as will be shortly demonstrated. This micro-scale forces the analyst to consider each note as potentially a reference to each other iteration of the same note. Additionally, the potential for reversibility and similarity on such a small scale of notes, especially when including the retrograde and inversion filters, can be daunting and perhaps unrealistic as a familiarized hearing of a piece's timespace.

Theme and variations, frequently mentioned alongside ‘larger’ forms but scarcely given the same amount of attention, offer a particularly interesting case for analysis in part because of the often explicit goal of the composer to present different-feature versions of a particular theme. Ivanovitch (2004) describes a variation as something heard by the listener and requiring both similarity and difference.¹⁰⁰ Each variation might exemplify different features of a theme, referring to said theme *via* a particular feature.¹⁰¹ He calls this process “hearing through”—not an exact analog to referentiality, but nonetheless an example of hearing certain sections in terms of others.¹⁰² Caplin (1998) might add that variations typically adhere to the same form as a theme.¹⁰³ Though the movement in question scarcely constitutes the same type of theme and variations as a tonal, 18th- or 19th-century work might, variation is very much at home in the realm of twelve-tone music. Bailey (1991) notes that retention of any one of many things may be sufficient to qualify as a variation, noting the parallels to serialism in the notion that “something that seems quite different is really the same.”¹⁰⁴

Given the number of angles from which it may be fruitful to approach twelve-tone music, analogs to filtering as a means of examination are relatively common, particularly with regard to pitch-class intervals, register, and transformational filtering.¹⁰⁵ Webern’s music in particular elicits responses seeking formal engagement and connection on small and large

¹⁰⁰ Bailey (1991), 195: “Just as the sonata symbolizes the most significant and fertile development of the principle of departure and return, variation form represents linear reiteration in its more nearly pure form. Evolving as it does through constant repetitions of the same material, in ever-changing guises but always similar enough to the original for its genesis to be recognized, variation form represents the unity/variety argument ... in a straightforward way: if the repetitions are too literal, variety suffers; if, on the other hand, they are so diverse that their common basis is obscured, unity is lost.”

¹⁰¹ Ivanovitch (2004), 118; more on listener’s role 125.

¹⁰² Ivanovitch (2004), 126 “hearing through.” He actually does use the word “reference,” but with a slightly different connotation; see 117.

¹⁰³ Caplin (1998), 217.

¹⁰⁴ Bailey (1991), 196. Mead (1993) also discusses the means by which Webern executes old forms with new twelve-tone material, 204.

¹⁰⁵ See for example Kurth (1996), 104. He also recommends familiarity with rows as a sort of filter itself, as a mnemonic device for remembering twelve-tone pieces more effectively (see 80). Mead (1993) also categorizes gestures and segments in terms of pitch class or an axis of inversion, 184.

scales, as in Mead (1993), Morris (2007), and Whittall (1983),¹⁰⁶ the prevailing theme being unity. Morris refers to Schoenberg's "unity of musical space" and discusses the overlap between mathematical transformations and row transformations.¹⁰⁷ In analyzing twelve-tone music, he writes, one looks for "properties among like entities, transformations/permutations... ways to extend adequately the relationships among pitch classes to time and other musical dimensions."¹⁰⁸ Whittall quotes Webern himself as saying, "Unity is surely the indispensable thing if meaning is to exist. Unity, to be very general, is the establishment of the utmost relatedness between all component parts. So, in music, as in all other human utterance, the aim is to make as clear as possible the relationships between the parts of the unity: in short, to show how one thing leads to another."¹⁰⁹ The role of unity in twelve-tone music is complicated, nonetheless, in that its identity as "twelve-tone" music was not necessarily intended to be heard. This somewhat hidden form of organization poses a problem for analysts: Is it "fair" to analyze a structural component that may be difficult or impossible to identify in an experience of the piece? To some extent, this Webern analysis is my attempt at capturing the degree of unity found in twelve-tone music via temporal referentiality and filtering.¹¹⁰ Given that a temporal reference analysis seeks a familiarized interpretation of its subject—able to "remember" both the past and the future—twelve-tone music presents a significant challenge with regard to what and how much to classify as referential.

¹⁰⁶ Mead (1993), 178 writes, "Relations in Webern's music engage a wide range of levels in the twelve-tone system in interlocking ways. We must be aware both of these different levels and of the ways they interact, as we move back and forth between the musical surface and the underlying, longer-range relations in his music." See also Morris (2007), 80 on cross-relations and intentionally constructed sameness between rows.

¹⁰⁷ Morris (2007), 77 and 83, respectively.

¹⁰⁸ Morris (2007), 96.

¹⁰⁹ Whittall (1983), 733.

¹¹⁰ Under Mead (1989), my approach likely falls under the category of "similarity questions" (42).

The Op. 21 variations movement is exquisitely crafted in accordance with Webern's lofty goals of unity. The row used throughout the movement is an intervallic palindrome, with an additional type of palindrome emerging via inversion.¹¹¹

There are, in fact, two kinds of palindrome here. The more obvious of these is a simple palindrome: the second hexachord of the row reads the same as the first in reverse, though of course it is transposed. A second, more subtle (and less exact) type of palindrome is inherent in the relationship between the prime and its inversion nine semitones higher.

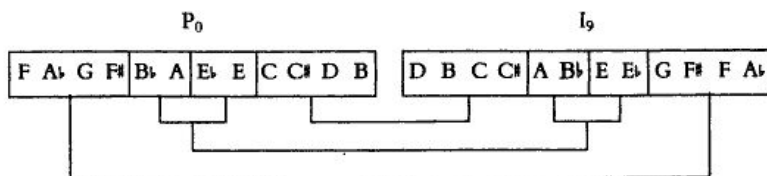


Fig. 3.17 Bailey (1991), illustration of two palindromic structures in Op. 21 (ii)

This movement for small orchestra adheres to a strict theme and variations format, though perhaps not under the traditional meaning of the genre. Not only is each section, including the theme and the coda, precisely the same number of measures long, but the whole movement operates on the same twelve-tone series of pitch classes. The movement is also heavily palindromic across its entirety, within individual 11-bar segments, and even within the series that drives each variation. Even with grouping into variations, a temporal reference sketch of all 99 measures based on the substance of the row could appear something like this:¹¹²

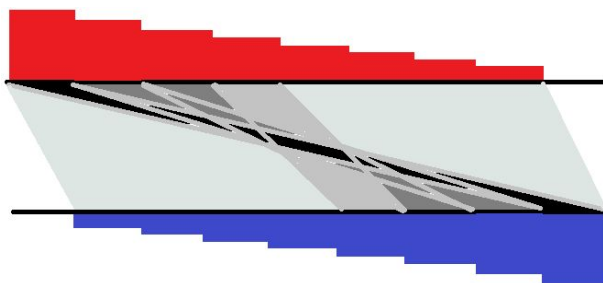


Fig. 3.18 Simple temporal reference diagram of Webern, Symphony op. 21 (ii)

¹¹¹ Bailey (1991), 18-19.

¹¹² For helpful analyses of this movement in depth see Rahn (1980) and D'Amario (2013, website).

Evidently, though this diagram does provide information about the temporal situation of the variations, it gives little information about the interactions of the substance within them and is not necessarily representative of how this piece might be interpreted. The symmetry of the variations is incorporated as part of the sketch, but much more can be captured visually and analytically using filtering techniques.

As mentioned above, Webern's row is retrogradable by pitch class intervals: the first six tones correspond with the last six. Retrograding the complete twelve-note series results in an identical series transposed by a tritone. In other words, the series is non-referential to itself by pitch class, retrograde pitch class, and pitch-class interval, but registers as one stairstep using a retrograde pitch-class interval ("R(pc interval)") filter.¹¹³

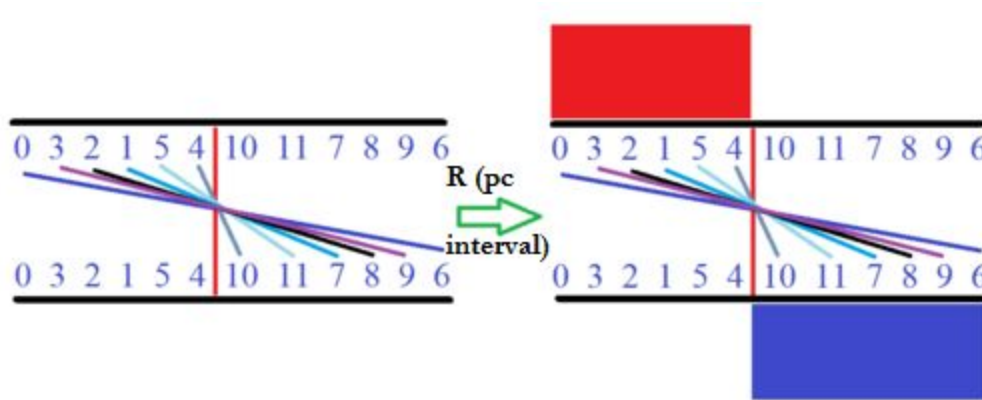


Fig. 3.19 Pitch-class series with retrograde pitch-class interval filter

Given the ubiquity of the row “theme” throughout the movement, this suggests a high degree of referentiality to begin with, particularly if utilizing R(pc interval). A listener/analyst completely familiar with Webern's row would feasibly be able to hear this symmetry or at least the relevance of the first half of the row to the second. This effect

¹¹³ Specifically, wherever I use “pitch-class interval” I mean the series of ordered pitch-class intervals.

might be more realistically (and intentionally on Webern's part) obscured by distributing the row across registers and instruments, employing octave and timbre displacement.

In order to analyze this movement, I primarily address the pitch-class and pitch-class interval filters, in addition to their retrograde and inversion counterparts. Exploring the extended network of row-related references reveals a claustrophobic web of nearly endless feedback. While these relationships are certainly interesting and mathematically elegant, I find it pertinent also to intersperse discussion of what "referentiality" a familiar analyst or listener might be more realistically able to hear. As such, this analysis is much more flexible than those of previous chapters of the Bach.

Throughout the analysis, I use $P(0)$ = the first series of pitch classes, where $0=F$, and $I(0)$ = the series inverted, also beginning on $0=F$. Although $P(n)=R(n)$ due to the interval content of the theme series, it also may be useful to denote $R(0)$ and $IR(0)$ as the retrograde and inverted retrograde series, respectively, especially given that $R(P(0))=R(6)$, which could cause confusion.

IV.1 Pitch-class filter effects

Applying exclusively the pitch-class filter to the score simply registers like series of notes as referential to one another. The pitch-class filters' specificity as a subset of pitch-class interval filters (the analog in this case for contour) proves useful particularly in narrowing the high pitch-class interval referentiality visually by type. The pitch-class filter for $P(n)$ registers its own full series $P(n)$ as referential in addition to the full series of $R(n)$, indistinguishable audibly as well as in terms of the theme row. The $R(pc)$ filter for $P(n)$ registers P and $R(n\pm 6)$. For example, $P(1)$ and $R(1)$ refer to each other under $P(pc)$, and $P(1)$ and $R(1)$ are referential with $P(7)$ and $R(7)$ under $R(pc)$. Likewise, the pitch-class filter on $I(n)$ or $IR(n)$ registers I and $IR(n)$, while the $R(pc)$ filter would also register $I(n\pm 6)$ or $IR(n\pm 6)$.

$I(pc)$, or the inverted pitch-class filter, “hears” references between $P/R(n)$ and $I/IR(n)$, though these seem hazier for even a well-trained listener.

IV.2 Pitch-class interval filter effects

The forward and retrograde pitch-class interval filters (equivalent for this piece, given that $P(n)=R(n)$) register as referential anything with a given sequence of intervals, whether they share pitch-class as well or not. This filter pre-retrograde is highly referential; $P(n)/R(n)$ registers all other $P(n)/R(n)$ and $I(n)/IR(n)$ registers all other $I(n)/IR(n)$. On a smaller scale, the pitch-class interval filter also registers as referential the second half of all corresponding series to the first half. Similarly to the pitch-class filter, $I(pc\ interval)$ links all P/R series to all I/IR series.

Table 2 Referentiality for Pitch-class and Pitch-class Interval Filters in Webern op. 21 (ii)

Referential	Filter	Referential
$P(n)=R(n)$	Pitch-class	$P(n)=R(n)$
$I(n)=IR(n)$	Pitch-class	$I(n)=IR(n)$
$P(n)=R(n)$	$R(pc)$	$P(n\pm 6)=R(n\pm 6)$
$I(n)=IR(n)$	$R(pc)$	$I(n\pm 6)=R(n\pm 6)$
$P(n)=R(n)$	$I(Pitch)$	$I(n)=IR(n)$
$P(all)=R(all)$	pc interval= $R(pc\ interval)$	$P(all)=R(all) + halves$
$I(all)=IR(all)$	pc interval= $R(pc\ interval)$	$I(all)=IR(all) + halves$
$P(all)=R(all)$	$I(pc\ interval)$	$I(all)=IR(all) + halves$

IV.3 Theme and Coda

In the theme/coda sections, P(0) and P(6) occur simultaneously, reaching an axis point at the same time. Since P(0) and P(6) are the same series in retrograde, they do not have the same order of pitch classes and thus the pitch-class filter records no referentiality. R(pc), on the other hand, illuminates references between the first half of P(0) and the second half of P(6) and vice versa.

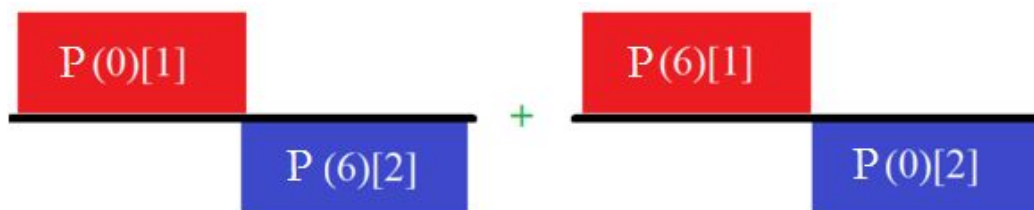


Fig. 3.20 Referentiality illuminated by R(pc) filter

As neither series present is in the inverted form, I(pc) and I(pc interval) do not show any new material. The pitch-class interval filter also fails to trigger any references, because the two series share pitch-class intervals simultaneously rather than displaced in time. For similar reasons, R(pc interval) simply reinforces the effect already in place by R(pc).¹¹⁴ The internal diagram for the theme section, then, resembles something like Fig. 3.21, color-coded for overlapping references.

¹¹⁴ Though note duration is not a part of the present analysis, R(note duration) also reinforces the existing diagram.

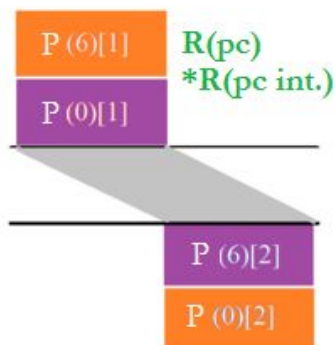


Fig. 3.21 Filtered theoretical temporal reference diagram for Theme section

Fig. 3.22 Theme section score

In truth, even after an innumerable number of listenings to the Theme, I find myself unable to process aurally the exact relationships between each note, especially with two row streams occurring simultaneously. With some focus, I am able to hear two series occurring simultaneously by the clarinet and horns-harp agents, and with some strain perhaps even the retrograde relationship between the two. I find it more natural to hear symmetry between the two halves through the symmetrical contour (including register) and occasional interval relationships. I hear the Theme as symmetrical across the axis in m. 6, but the retrograde relationship within the row is clearer at the ends and within a measure of the axis.

Theoretical form aside, were I to construct a diagram of my perception of P(pc interval),

R(pc interval), P(contour), R(contour), and maybe a minimal amount of P and R(pc), I might produce a sketch more like this:

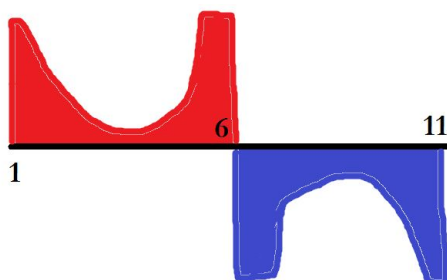


Fig. 3.23 Sketch of my hearing of the Theme section

The coda, though employing the same rows as the Theme, is somewhat easier to hear as completely symmetrical, primarily due to the thinner texture and reiteration of the same pitches in the same instruments. My sketch for the referentiality in the Coda might be stronger throughout, more closely resembling the theoretical diagram.

Fig. 3.24 Coda section

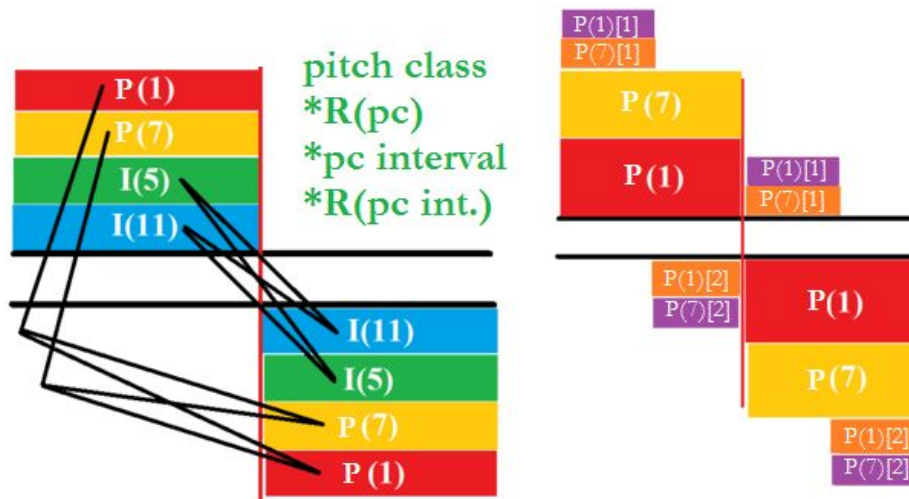
Referentiality between the theme and coda would be maximized by attention to the usage of P(0) and P(6), though this effect is stronger theoretically than aurally. Though I hear the two sections starting and ending with the same sonorities and sounding similar in terms

of pitch near the middle of each section, I find myself unable to actively focus on the shared rows. Referentiality between the two larger sections would certainly be present, though perhaps lower than imagined on a diagram of an infinitely familiar analyst's hearing.

Although the variations, though more complicated, seem to function aurally on approximately the same principles as the Theme and coda, it may be helpful to address them.

IV.4 Variation I and Variation VII

The first variation consists of P(1), P(7), I(5), and I(11), with each occurring twice. The pitch-class filter (and thus the pc interval filter), then, illuminates a strong referentiality between the first half and the second half of the variation. Given that P(1)/P(7) and I(5)/I(11) are retrogrades of one another, R(pc) (and thus R(pc interval)) further reinforces that referentiality while adding second-half connections within each series. Though there are inversions present, they do not correspond by pitch-class; therefore I(pc) remains dormant. Finally, I(pc interval) draws references between the P and I lines. Drawing a diagram with all of these connections is virtually impossible, but intuiting each successive level, its past and future tense-ness, and its relationships with all other substance can give an idea of the vast degree to which even a single variation is interconnected.



Figs. 3.25 and 3.26 Large-section connections between the four series / A subset or snapshot of the references between just the P(1) and P(7) series

Listening without the score, I perceive the symmetry within Variation I to be clearest around the middle (m. 17), obscured slightly at the ends by the violin line seeping into Theme and Variation II on either side. It seems extremely impractical to imagine someone being able to hear four simultaneous rows occurring in this variation, but the consistency of register and execution (and execution technique, e.g. pizz./arco) renders the collective symmetry more audible. The same pattern occurs in Variation VII, with a dynamic contrast and tempo change accentuating the turnaround point. Variation VII constitutes perhaps the best example in the piece of feeling like the substance has stopped and turned around to occur again backwards. Whereas large-scale recognizable references such as those in the Brahms lend themselves more easily to memory (or at least mine), the complexity and difficulty of processing the events in the Webern make the symmetry more recognizable in the sections that are closer together (i.e. pitches occurring nearer to the variation's retrograde axis) or at the ends. This movement's analysis is forced into being more "forgetful" in nature, potentially as a way to compensate for the onslaught of possible symmetry to be

remembered. Interim duration seems to matter less to determining referential strength in listening to this movement.

IV.5 Variation II and Variation VI

The second variation adds yet another layer of complexity: two different agents in two spans of time for the substance. Webern's ostinato horn line simultaneously executes I(0) and P(11) in Variation II and I(6) and P(5) in Variation VI, while four other instrument groups play P(2) and I(10) followed by their retrogrades, P(8) and I(4), after the halfway point. The pitch-class filter alone captures nothing, but R(pc) highlights the referentiality between $P(2) \longleftrightarrow P(8)$ and $I(10) \longleftrightarrow I(4)$. Pitch-class interval reinforces these referential blocks, while R(pc interval) adds the smaller referential blocks between the second halves of P(2)/P(8) and I(10)/I(4). I(pc) yields nothing; I(pc interval) connects the P(2/8) to the I(10/4) figure.

In interpreting Variations II and VI more "subjectively," a discrepancy emerges between the ability to perceive referentiality in the horn's agential stream and the other instruments'. Due to the cooccurrence of two rows simultaneously in the horn ostinato of Variation II, I process only the steady rhythm and hear very little if any of the pc-interval retrogradability of the rows. The horn ostinato in this case would simply make a gradual slide from future to past, as I perceive intuitively only the note duration filter. Symmetry seems much more easily perceived in the other instruments, once more due to a lack of registral shifts on pitch classes within the variation and the shorter duration of the full rows. Variation VI registers symmetry somewhat less strongly, without the ostinato as a rhythmic anchor point for reference. Nonetheless, I hear this variation similarly to its sibling: the more condensed rows facilitate hearing the symmetrical pitches, particularly nearer to the axis point (m. 72). In both cases, the inversion filter seems completely obscured by all the other

material. I hear the inversion filter at most in terms of interval structure, but certainly do not “recognize” aurally its transformation of the rows.

IV.6 Variation III and Variation V

The variations closest to the middle have five small palindromic sections, alternating three I(3)/I(9) pairings with two P(0)/P(6) pairs. In this instance, the pitch-class filter already makes stairsteps with each repeated set of pairs; R(pc) causes said steps to increase in referential strength as P(0)/P(6) and I(3)/I(9) reference their concurrent retrogrades. R(pc interval), as in Variations II/VI, highlights the reversibility of each individual series, and the I and P pairs referentially acknowledge one another with the I(pc interval) filter. This set of variations is the most internally referential, with five subsections. Perhaps as a result of the more regular rhythmic pattern and the simultaneity of many pitches repeated, therefore creating a more consistent sonority, Variation V is the most “hearable” to my ears. The symmetry of rhythm, pitch, and instrumentation is evident within each of the smaller sections as well as the larger one. I am unable to hear the contrast between the I rows and P rows either as pitch-class interval inversions of one another or as different sonorities alternating in the five subsections of this variation.

The nuances of Variation III are slightly less hearable due to the absence of any ostinato pattern (as in the difference between Variation II and VI), but the turning point at measure 39 and the beginning and end of the variation are considerably more of an aural anchor point. This variation emphasizes even further with tempo and texture differences the tendency to hear symmetry more clearly at the edges and middle of the subgroups. The orchestration is strikingly different from Variation V, such that I only hear the two sections as related by their fast pacing and little by other sameness elements.

IV.7 Variation IV

This variation is the only actively asymmetric figure in the piece. The fourth variation contains P(8), P(6), P(7), and I(5) simultaneously, followed by notes from these four series somewhat out of order while preserving some aspects of pitch-class interval or pitch class from the first half in the form of two-note slurs. The pitch-class filter does nothing significant; R(pc) and I(pc) are also minimally effective in illuminating the section's content. In fact, the pitch-class interval filters only illuminate patterns within the first half and the second half, but not as much between the two. To highlight the existing symmetry in the variation, some sort of "pitch-class collection" filter would be necessary. This variation is not only minimally referential internally compared to the other eight sections of the piece, it is also without a structural pair and thus even less substantially connected to the movement. That being said, the form is still rooted in Webern's base series, providing a reminder that even the most minimally connected section is still strongly tied to the thematic material of the piece. Variation IV feels deceptively symmetrical to listen to due to the pitches present. The inexactness of a full retrograde seems to matter less as the sonorities are made more straightforward by the calm quarter note pattern. Measure 50, the medium axis for the entire movement, emphasizes the turnaround point, further enhancing the illusion of symmetry within the variation.

IV.8 Overall form

Given how difficult it may be to produce specific diagrams of individual variations, is it possible to produce a global diagram for the movement? It appears that most of the symmetries are within individual variations and between corresponding variations in the overall palindrome. The pitch-class interval filters especially illuminate the relationships

between sections; ironically, for all the complexity of the variations and the intricate network of referentiality down to individual pitch classes, it would seem that the initial instinct of Fig. 3.18 is the simplest way to reconcile all these details.

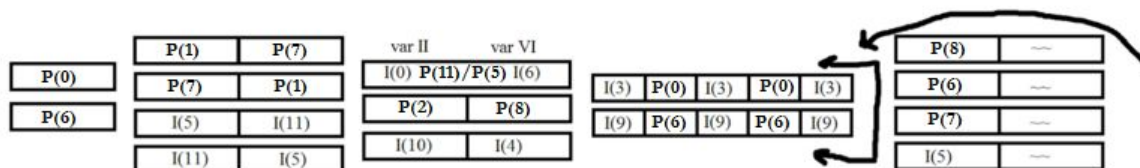


Fig. 3.27 Outline of theoretical overall movement form

V. CONCLUSIONS

In the cases both of the Bach and the Webern, filtering has enhanced the scope of temporal referentiality where it may not otherwise have been useful. Operating on the general principle of “sameness,” the fugue subjects and tone rows might have produced meaningless stairsteps; filtering by agents (voices or fugue subjects) or features and transformations (pitch class, pitch-class interval, retrograde, inversion) provides a means of discussing how references come into being in each of these pieces’ timespaces.

In many senses, the four voices of the fugue all serve to construct their own timespaces, hinting at possibilities for analyzing referentiality between different pieces. The interacting fugue subjects create interwoven yet distinct referential patterns, with the first subject sometimes separate from the second but the second never separate from the first. The temporal reference diagram for the Bach showcases some of the fugue’s identity as a process: Large-scale references are indeed less significant to the piece’s form than the gradual using up of a steady stream of the same ideas distributed between four agents.

The Webern movement operates somewhat differently, provoking considerations of the limits of referentiality and transformational filtering. Whereas the subjects are clearly audible to listeners of the Bach fugue, the tone rows are fairly well obscured by registral jumps, distribution between instruments, and interaction between different versions or transformations of the row concurrently. Such a complex texture is difficult to manage both in considering all possible references as well as in considering the extent of a familiar hearing of the movement. Here referentiality divides between the objective and the subjective. Where a hypothetical objective hearing of the Webern would process an endless degree of constant referentiality between variations, phrases, and even individual notes, a subjective hearing would process something more akin to a general feeling of symmetry, phasing in and out of clarity.

Though filtering may not be able to solve all of the problems of referentiality and particularly its visual representation, it can provide new strategies for highlighting past and future references heard amidst complex tangles of overlapping medium and substance.

CONCLUSION

Temporal referentiality could constitute a virtually endless project, seeing as it connects to so many different fields of research: form, time, phenomenology, linguistics and word tense, literature, variation, continuity, reference, and narrative, to name a few. The three chapters of this thesis have focused on introducing temporal referentiality primarily as an analytical method, unpacking some of the resulting ways of thinking about music. At its simplest, referentiality looks for similar sections of substance at different points in time and equates them or compares them. A musical entity is treated as substance in a medium; *temporal* referentiality is intentionally constructed to apply to temporally extended entities—that is, entities in a temporal medium.

A temporal reference analysis primarily asks: (1) Does the present moment share its substance with any other moment in the piece? = Do there exist references? (2) If yes to (1), how are these similar or same sections *temporally* related? = What are the relative tenses or orientations of these references? (3) If yes to (1), what makes these sections the same or not? = What features or elements of sameness are present between references? The answers to these questions can be organized in an analytical representation.

The above questions also roughly correspond to the three chapters of my thesis. Chapter I serves as a point of establishment, asking what references are, approximately how to determine their presence, and how to represent patterns of referentiality. These patterns can take the form of a visual diagram, the primary representation developed here; alternatively, as posited less formally in Chapter II, the referential structure of an entity can be roughly captured via any medium accommodating or illustrating temporal extension. Chapter II addresses the temporal aspect of referentiality, elaborating on the rudimentary concept of orientation proposed in Chapter I. The role of temporality in creating referential

form requires an acknowledgement of omniscience, or complete familiarity, within the bounded span of time a piece occupies. Temporal orientation existing beyond music, literature and text prove to be valuable analogs for not only describing how an analysis is carried out, but also constituting the analytical product itself. By nature of being representations, both diagrams and model prose compositions have unique shortcomings that may be able to speak to philosophical and logistical differences between these interpretations and music. Chapter III attempts to adapt the analytical methods from I and II to bring the analytical representations closer to the substance of the actual entity via a system of filtering based on different components of sameness. Filtering acts as a tool for resolving incongruities in temporal/substantial streams within an entity. The three chapters have altogether attempted to present different ways, facets, and implications of implementing temporal referentiality in interpreting a musical entity, illustrated by four analyses: Bartók's String Quartet #4 (i) as an introduction to the topic, Brahms's Violin Concerto (i) as an illustration of how orientation can be conceived of as tense, Bach's Contrapunctus #9 from *The Art of Fugue* as an illustration of agential filtering as a solution to medium-nonsameness, and Webern's Symphony op. 21 (ii) as a provisional representation of feature and transformational filtering as a resolution for substance-nonsameness.

Despite my efforts to encapsulate many of the larger advantages and problems of temporal referentiality, much remains in terms of the possibilities for more applications as well as the potential problems to be resolved. A fully developed theory would need to fully explore the implications of temporal referentiality for analysis, performance, composition, historical context, and listening.

Given that temporal referentiality has primarily been addressed analytically in this study, it could potentially be useful to expand its analytical scope. I would be interested to see what might happen in an attempt to reframe existing models of form or analysis in terms of their referentiality: What might be lost or gained in such a reconstruction of established

strategies? Could existing sonata form templates be recaptured visually? How would Schenkerian analysis be suited or unsuited to be framed in terms of referentiality; in other words, is there a place for prolongation in my current conception of reference? An expansion of musical literature for analysis would likely also prove fruitful to discovering problems and hence solutions to temporal reference analysis as it stands. All of the music analyzed in depth in this thesis falls under the broad umbrella of the Western art tradition. Temporal referentiality reflects the priorities of this tradition, but could feasibly be applied (potentially less usefully) to Western popular music or non-Western traditions. Might these applications constitute Western-art hearings of non-Western music?

Possibilities for analytical applications of this methodology may exist outside the realm of music as well. One could hypothetically imagine a temporal reference analysis of dance, literature, speech, film, or theater—just as musical entities are represented using analytical figures compatible with temporal media, other entities can likewise be so represented, since the form of an entity has here been treated as its substance's situation in time, regardless of what the substance may constitute. These other temporal entities could similarly be used as analytical representations of pieces of music, e.g. a dance with the same temporal reference form as a nocturne. In this way temporal referentiality vastly expands the hypothetical possibilities for what constitutes a “model composition,” expanding the possibilities for composition beyond music. One could come up with a temporal reference form without deriving it from an artistic model source, then using this model as a loose formal outline for composition.

A final consideration regarding analysis relates to the concept of familiarity. Chapter II discussed the assumption of complete familiarity within the bounded timespace as a fundamental element of temporal reference analysis, analogous to Cone's “third reading” of a story. The question then arises of what an unfamiliar temporal reference analysis constructed in real time might look like—what if the analyst truly was unfamiliar with the

substance and constructed a progression of analyses with each consecutive listening, bringing a temporal reference analysis “into focus”? An analysis that truly reflected the process of becoming familiar with a piece would add another temporal dimension, perhaps moving closer to the perceptual truth of musical experience.

In addition to familiarity generally being a prerequisite for analysis, it typically also serves as a prerequisite for performance. The performer is the executor of the references present within a timespace; the performer begins and ends this timespace. By taking familiarity into account, the line between analysis and performance is blurred. A temporal reference analysis is in many senses an analytical “performance” of a piece, while a performance may constitute an analysis in other senses. One could also compare the amount of sameness or lack thereof between two different performances of the same piece or two different temporal reference analyses of the same piece. It seems a worthy goal to move toward decentering the score *as* the musical entity in analysis, focusing on listening and experiencing-analyzing the music as it is physically presented by a performer.

External referentiality also holds promise for future investigation. What would happen if one were to attempt to analyze referentiality between two separate pieces, two movements of the same piece, or many pieces from the same historical period? Historical contextualization and general attention to the content of a piece’s substance could vastly improve temporal referentiality as a representation of hearing. As presented here, there exists no mechanism for accounting for different types of difference. Referentiality thus far is all comparison, no contrast. Similar possibilities could arise for filtering: It appears that in looking for sameness between sections, one is simply filtering for a particular combination of features, particular content. In seeking other iterations of a “first theme,” one applies a “first theme” filter. Could there be a way to “filter” focusing on difference rather than sameness?

Another question concerning temporal referentiality is its name. Might there be a better description of form, positioning, relativity, sameness, force as presented in this

project? Many scholars have used different terms to refer to concepts related to mine. It may be worth examining whether it is preferable to adopt existing terminology or if the present description and naming is appropriate.

Metaphors and analogies are equally fruitful for future research. If a reference has a direction (tense) and a magnitude (strength), it could be framed as a vector or force, with an abstract gravity of sorts holding references together. What would constitute a musical “body?” How do references exert force on one another? Are smaller references absorbed into larger ones as if in orbit around them? What would a musical black hole entail? Would it be then possible to quantify referentiality, and would this be detrimental to its interpretive aspect and goals?

Temporal referentiality is simultaneously old and new in its conception, reflective of its past and future. Unfortunately, within the confines of human experience I cannot speak to all the solutions to the above problems, but it is my hope that future research, be it my own or others’, will contribute to and develop the ideas here presented into a full-fledged theory of temporal and formal analysis for music and related entities.

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