THE INTERACTION OF LINEAR AND VERTICAL TIME IN

MINIMALIST AND POSTMINIMALIST PIANO MUSIC

A DISSERTATION IN
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by
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ABSTRACT

Minimalist compositions thwart most attempts at analysis given their remarkable simplicity. Moreover, minimalist works are deliberately non-manipulative in order to allow the listener freedom in constructing his or her own experience. For formalist analysis of this music to be of value, it must account for this freedom while simultaneously explaining beyond mere description, a duality which can be achieved by incorporating musical time. Jonathan Kramer describes minimalist compositions as existing in vertical time, an almost eternal present. This notion does much to explain the general listening experience, but fails to accommodate the variety found in minimalism. Instead, it is best to see in this genre that an interaction between the musical elements that create vertical time and those that create linear time establishes the musical time of each piece.

This dissertation explores minimalist music's manipulation of time through brief analysis of Terry Riley's *Keyboard Study no. 1*, Steve Reich's *Piano Phase*, and Philip Glass's *Two Pages*. While all three pieces create an overall sense of vertical time, linear time is also present, particularly at the local level, with each composition creating a unique

temporal experience. The concepts established are then expanded to a full analysis of Tom Johnson's *An Hour for Piano*, which not only has interaction between the different species of musical time, but also interacts with objective time and varieties of psychological time.

The implications of this theoretical approach are even more significant for postminimalist music. As postminimalist composers combined minimalism with a variety of other influences, linear time became more prominent but did not completely overwhelm the sense of vertical time. Instead, postminimalist music tends to create a hybrid between the two, a conclusion that helps justify and clarify the use of the term "postminimalist." This clarity is demonstrated through brief analysis of pieces by William Duckworth, Peter Garland, Beth Anderson, James Sellars, and Paul Epstein. A full analysis of David Borden's *Double Portrait* then shows the full potential of this approach as the piece begins in near-vertical time and ends in linear time.

The faculty listed below, appointed by the Dean of the Conservatory of Music and Dance, have examined a dissertation titled "The Interaction of Linear and Vertical Time in Minimalist and Postminimalist Piano Music," presented by Richard Andrew Lee, candidate for the Doctor of Musical Arts degree, and hereby certify that in their opinion it is worthy of acceptance.

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PREFACE

This project began in early 2007, when Dr. David D. McIntire, then a fellow graduate student, received a score that he was anxious to show me—William Duckworth's *Time Curve Preludes*. As we followed the score with Neely Bruce's recording, I was struck by both the beauty and complexity of these short preludes. David told me that this was in some ways the quintessential postminimalist piece, and while I had never heard the term before, I was anxious to hear more of these types of works. It was then that I turned to Dr. Andrew Granade, whose research interests I knew also concerned twentieth century American music. He graciously agreed to advise me on an initial research project though I had no idea about its direction save only that it would concern postminimalist piano music. After he gave me a rather lengthy list of composers, I spent the summer collecting, listening to, and playing as much piano music as I could.

As the fall semester began, I quickly realized how difficult this project would be. The pieces I had collected were different from one another in many important respects, and I was having a hard time getting a handle on the genre much less finding a direction for research. It was not until my mind turned to the perception of time that things began to fall into place. With minimalist piano pieces, I realized that I got the most enjoyment by taking on a meditative mindset and letting my mind freely explore what I was hearing at the moment, whereas with postminimalist piano pieces, I realized that my listening experience was somewhat similar to that of common practice music. That is, I found myself anticipating what was to come and referencing back to what I had already heard, in other words, moving around through time. Not only did this contrast with the feeling of stasis I had listening to

minimalist music, but this music also seemed to accomplish movement through time without many of the devices of common practice music. This prompted my initial writing on the subject, where I attempted to clarify the distinction between minimalism and postminimalism in terms of musical time, with minimalism being vertical and postminimalism being linear. Dr. Granade encouraged me to consider expanding this research into a dissertation, and so I did.

In September of 2009, I presented a paper on David Borden's *Double Portrait* at the Second International Conference on Minimalist Music. At the conference, it was apparent that several speakers thought of vertical time and linear time as being mutually exclusive, but I was becoming increasingly less convinced of that idea. During one paper session I jotted down a potential title for my dissertation, "The Spectrum of Linear and Vertical Time in Minimalist and Postminimalist Piano Music." This brief thought prompted a new direction in my research, and I started work almost as soon as the conference ended. I eventually came to refine the title by changing "spectrum" to "interaction" as the latter allowed for a more dynamic intermingling of these two species of time.

CHAPTER 1

INTRODUCTION

Scholarship on minimalist music has centered on four composers—La Monte Young, Terry Riley, Steve Reich, and Philip Glass—nearly since its inception.[1] These composers, initially grouped together by Tom Johnson in *The Village Voice* in 1972 and in the last chapter of Michael Nyman's 1974 book *Experimental Music: Cage and Beyond*, were certainly not the only ones exploring the possibilities of minimalist music in the 1960s.[2] Kyle Gann describes a "cast of dozens" in his article "Minimal Music, Maximal Impact," but many of these other composers moved on from minimalism to embrace different styles or even different fields entirely.[3] These four composers, through their compositional innovation, notoriety, and writings, continue to be considered foremost amongst minimalists. This position is strongly evidenced by books such as *American Minimal Music* by Wim

[1] Until explicitly stated otherwise, the term minimalism will refer to those pieces written before 1976, such as the early works of Reich, Glass, and Riley that tend to be more rigid in terms of process and repetition, while postminimalist will refer to the style that grew out of these works.

[2] Tom Johnson, "La Monte Young, Steve Reich, Terry Riley, and Philip Glass" in *The Voice of New Music* (Eindhoven: Apollohuis, 1989), [PDF version online] http://www.editions75.com/Books/TheVoiceOfNewMusic.PDF (accessed 19 May 2010): 29; Michael Nyman, *Experimental Music: Cage and Beyond* (New York: Schirmer, 1974).

[3] Kyle Gann, "Minimal Music, Maximal Impact," New Music Box, 1 November 2001, http://www.newmusicbox.org/page.nmbx?id=31tp05, (accessed 1 August 2010).

Mertens, *Minimalism: Origins* by Edward Strickland, and *Four Musical Minimalists* by Keith Potter that continue to focus on them almost exclusively.[4]

There has been less consensus concerning the origins of the style than there is about the importance of these composers, and scholarship remains divided among three main ideas. The first is that minimalism was an extension of the anti-dialectic movement and experimentation that preceded it. Mertens writes that "It is clear that repetitive music can be seen as the final stage of an anti-dialectic movement that has shaped European avant-garde music since Schoenberg, a movement that reached its culmination with John Cage."[5] Nyman and Strickland reinforce this viewpoint in writings already mentioned, as does Elaine Broad in her article, "A New X? An Examination of the Aesthetic Foundations of Early Minimalism."[6]

Other authors have seen minimalism less as an extension of these previous musical developments and more of a reaction against them. As Jonathan Bernard writes, "It can be persuasively argued that music of chance ultimately served the minimalists as a negative ideal, an example of what not to do, in their efforts to create a viable alternative to (what they came to see as) the needless and overly intellectual complexities of serialism."[7] Potter and

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[4] Wim Mertens, *American Minimal Music* (New York: Alexander Broude, Inc, 1983); Edward Strickland, *Minimalism: Origins* (Indianapolis: Indiana University Press, 1993); Keith Potter, *Four Musical Minimalists* (Cambridge: Cambridge University Press, 2000);

[5] Mertens, 87.

[6] Elaine Broad, "A New X? An Examination of the Aesthetic Foundations of Early Minimalism," *Music Research Forum* 5 (1990): 51-62.

[7] Jonathan Bernard, "The Minimalist Aesthetic in the Plastic Arts and in Music," *Perspectives of New Music* 31, no. 1 (Winter, 1993): 97.

Gann share this viewpoint in their writings, as does Timothy Johnson in his article "Minimalism: Aesthetic, Style or Technique?"[8] Finally, other writers attribute the development of minimalism to the general culture at the time. Robert Fink, in his book *Repeating Ourselves: American Minimal Music as Cultural Practice*, cites diverse sources from advertising and consumerism to disco, while Jonathan Kramer in *The Time of Music*, mentions the increasing influence of nonwestern cultures and development of recording technology.[9]

From a theoretical standpoint, minimalism has been even more problematic than the expected differences in historical approaches as it frustrates attempts to use standard analytical techniques. Ian Quinn summarizes the problem: "Traditionally, analysis aims to reduce the information content of a piece—productively, and however provisionally temporarily, and contingently—by parsing it relative to some well-understood system of formal conceptual categories. Process music comes to the table already digested."[10] Jonathan Kramer echoes this problem in his own analysis of Frederic Rzewski's *Les Moutons de Panurge* when he writes that minimalist music can "scarcely be analyzed, in the usual sense of the term . . . It is essentially pointless to explicate."[11]

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[8] Timothy Johnson, "Minimalism: Aesthetic, Style, or Technqiue," *The Musical Quarterly* 78, no. 4 (Winter, 1994): 742-773.

[9] Robert Fink, *Repeating Ourselves: American Minimal Music as Cultural Practice* (Los Angeles: University of California Press, Ltd., 2005); Jonathan Kramer, *The Time of Music* (New York: Schirmer Books, 1988).

[10] Ian Quinn, "Minimal Challenges: Process Music and the Uses of Formalist Analysis," *Contemporary Music Review* 25, no. 3 (June 2006): 292-293.

[11] Jonathan Kramer, *The Time of Music* (New York: Schirmer Books, 1988), 388.

Still, many scholars, such as Potter, continue with more standard analyses, describing process and structure while also acknowledging the few tonal implications. Despite the apparent complications with this approach, these analyses have yielded results that do in fact delve beyond the surface of the music. For example, Steve Reich's early phasing pieces have notably been the subject of analysis by Richard Cone, whose beat-class approach to rhythmic structures has been also been adopted by John Roeder and Roberto Antonio Saltini.[12] Paul Epstein also produced one of the first meaningful analyses of the events between stages of phasing in his article, "Pattern Structure and Process in Steve Reich's *Piano Phase*."[13]

On the other hand, others see these formalist analyses as empty and incomplete when trying effectively to describe and understand this music. Jonathan Bernard writes that minimalist music demands "that the prospective investigator be willing, not to abandon quantitatively oriented methods, but to deemphasize them somewhat in favor of taking seriously the connections between minimal music and minimal art and treating them, rather than simply as an avenue for metaphorical comparison, as a way of 'seeing' the music, or *as if* one could see it."[14] Some, such as George Rochberg and Erik Christensen see value in this

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[12] Richard Cohn, "Transpositional Combination of Beat-Class Sets in Steve Reich's Phase-Shifting Music," *Perspectives of New Music* 30, no. 2 (1992): 146-177; John Roeder, "Beat-Class Modulation in Steve Reich's Music," *Music Theory Spectrum* 25, no. 2 (Autumn, 2003): 275-304; Roberto Antonio Saltini, "Structural Levels and Choice of Beat-Class Sets in Steve Reich's Phase-Shifting Music," *Intégral* 7 (1993): 149-178.

[13] Paul Epstein, "Pattern Structure and Process in Steve Reich's *Piano Phase*," *The Musical Quarterly* 72, no. 4 (1986): 494-502.

[14] Jonathan Bernard, "Theory, Analysis, and the 'Problem' of Minimal Music," in *Concert Music, Rock, and Jazz Since 1945: Essays and Analytical Studies*, ed. Elizabeth West Marvin and Richard Hermann (Rochester: University of Rochester Press, 1995): 266.

spatial approach, though without Bernard's explicit connection to minimalist art.[15] Fink disagrees when he writes that "the ascetic formalism of minimalist music simply bounces back off the formalist asceticism of 1960s visual art, highly-polished mirrors reflecting each other's cultural emptiness in infinite analytical regress."[16] It is clear that minimalism presents a challenge in terms of analysis. The dramatic reduction of musical material, combined with gradual change means that most of the work's 'secrets' are laid bare not only for the theorist but also for the listener. While it is possible to find avenues into a deeper understanding of the music, there are still scholars who find such attempts to be empty and incapable of adequately describing the listening experience.

Postminimalism

In some respects, minimalism, at least as it was in the late 1960s and early 1970s, was short lived. By 1976,[17] it was becoming increasingly clear that composers such as Young, Riley, Reich and Glass were beginning to move away from the strict compositional techniques they had developed. As Reich describes it, "My early pieces are very clear examples of a strict working-out of certain musical ideas that were new . . . but once you've

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[15] George Rochberg, "The Structure of Time in Music: Traditional and Contemporary Ramifications and Consequences," in *The Study of Time II*, ed. J.T. Fraser and N. Lawrence (New York: Springer-Verlag, 1975), 136-149; Erik Christensen, *The Musical Timespace: A Theory of Listening*, Vol. I (Aalborg: Aalborg University Press, 1996).

[16] Fink, 18.

[17] Potter, 16. Tom Johnson likewise cites 1976 as a year of change in his article, "The Years of Innovation Pass On" in *The Voice of New Music* (Eindhoven: Apollohuis, 1989), [PDF version online] http://www.editions75.com/Books/TheVoiceOfNewMusic.PDF (accessed 19 May 2010): 117-119.

done that for a while—you can't write the same piece over and over again. The artists I admire are the ones that move on."[18] Glass takes the idea even further by rejecting the term minimalist as it is applied to his later works.

> I think that word should be stamped out! To call it "minimal" is just a mistake. This technique is capable of supporting music of richness and variety. If you are talking about *Music in Fifths*, okay. If you want to talk about *Violin Phase*, okay. But if you want to talk about the works which have continued these ideas, it's not at all an appropriate term.[19]

This shift was subtle and not so much an immediate departure from the previous strictness of minimalist process so much as an inclusion of previously neglected musical elements, adding a richness and variety to the music. These elements consisted of melodic emphasis, exploration of textures, and, perhaps most importantly, "the arrival of a kind of harmonic motion."[20] This change was not only important for the music of these composers, but also anticipated the postminimalist movement that began only a few years later.

The term postminimalism was first used by and applied to the works of John Adams. As Adams writes about his *Phrygian Gates* (1977), "Insofar as the piece incorporated a steady pulse and utilized repetition and a slowly evolving harmonic rhythm, one could classify it as a minimalist composition, but its formal and dramatic design was the systematic

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[18] Steve Reich, "Second Interview with Michael Nyman," in *Writings on Music: 1965-2000* (New York: Oxford University Press, 2002), 94.

[19] Tim Page, "Dialogue With Philip Glass and Steve Reich (1980)," *Writings on Glass* (New York: Schirmer Books, 1997), 50.

[20] Potter, 16.

disruption of minimalism's usual regularities."[21] At the most basic level, Adams's statement is an excellent starting point for understanding postminimalism. That is, postminimalist compositions demonstrate the minimalist influence as certain processes or aesthetic values are freely incorporated with a composer's personal style. In 1977-78, William Duckworth composed his *Time Curve Preludes*, which Kyle Gann argues is the first postminimalist piece written.[22] These twenty-four short piano works also borrowed many qualities and techniques from minimalism, but Duckworth blended these with other musical influences, even to a greater extent than Adams did at the time.

Most scholarship concerning postminimalism has focused on developing the term, as the genre is still relatively new. Dimitri Cervo, through analysis of the later works of Reich and Glass, along with pieces by Adams, Nyman, Andriessen, and Pärt, developed the following definition of postminimalism:

> 1) All works depart from Minimalism in some aspect (technical, stylistic, esthetical, or altogether), and eclectically mix it with other techniques, other stylistic elements, reaching original artistic results, but in which Minimalism is still felt.
> 2) The use of melodic lines and melodic expressiveness is of paramount importance. Melodic lines may assume a main role in the composition, they may appear alone or with Minimalist elements working as a background accompaniment for them.
> 3) The works are articulated in several movements or sections, with different tempi, that are contrasting and/or can be easily distinguished from each other, breaking the sense of continuity typical of Minimalist works.[23]

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[21] John Adams, "The Machine in the Garden," John Adams: Interviews, Articles, Essays, 3 May 2007, http://earbox.com/inter-machine.html (accessed 5 Dec 2007).

[22] Kyle Gann, "Minimal Music, Maximal Impact."

[23] Dimitri Cervo, "Post-minimalism: A Valid Terminology?" *Ictus* 1 (Dec 1999): 42.

This definition does much to pare down minimalist-inspired music, but still remains rather broad. The inclusion of melodic lines in the definition is important for unifying these pieces while distinguishing them from minimalism, but even with that distinction there is little to suggest how a postminimalist piece might function aside from not being strictly minimalist.

Kyle Gann, perhaps the most prolific writer on postminimalist music, expands on Cervo's definition.

> Postminimalist music tends to be tonal, mostly consonant (or at least never tensely dissonant), and based on a steady pulse. The music rarely strays from conventionally musical sounds, although many of the composers use synthesizers. Postminimalist composers tend to work in shorter forms than the minimalists, 15 minutes rather than 75 or 120, and with more frequent textural variety. Their preferred medium is often the mixed chamber ensemble pioneered by Glass and Reich, though without the minimalist habit of ensemble unison. Like most Baroque works, the music does not tend to change mood or momentum within a movement. The music may be beautiful, emotive, mysterious, eclectic; but mercurial and full of contrast it is not.[24]

While this definition goes much more into the aesthetic properties of postminimalist music, not all postminimalist pieces will share all of these qualities. By using words such as "tend" and "preferred," Gann is keeping this definition deliberately open so as not to exclude too many pieces. In doing so, however, he is also being more descriptive and less definitive.

Certainly, postminimalist music is difficult to define. In order to be more absolute, Cervo must limit himself to three extremely broad aspects of postminimalism, and in order to better characterize post-minimalism, Gann is forced to be less absolute. Such difficulty may have caused a slower acceptance of the term by some such as Jonathan Bernard, who writes,

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[24] Kyle Gann, "Minimal Music, Maximal Impact." For examples of postminiamlist music, see Gann's "Discography of Postminimal, Totalist, and Rare Minimalist Music," http://www.kylegann.com/postminimaldisc.html (accessed 1 Aug 2010).

"While postminimalism seems to mean *something*, in the end it can only serve as a place marker for more precise terms, the coming of which probably awaits greater historical perspective on this period."[25] Still, the shared aesthetic qualities and compositional techniques between minimalists and postminimalists, along with the noted differences between the two, suggests at the very least that the concept of postminimalism requires further exploration.

Theoretical analysis of postminimalist works remains limited, and these tend to be formalist, as Quinn would describe the term, as opposed to drawing on other disciplines such as Bernard and Fink have done with minimalism. Notable published examples of such analyses are Adam B. Silverman's analysis of William Duckworth's *Southern Harmony*, Walter Frank's thesis on Duckworth's *Time Curve Preludes* and *Imaginary Dances*, and John Solomon's dissertation on the piano music of James Sellars.[26] Kyle Gann has also done several short analyses of postminimalist music on his blog, *PostClassic*, as in his article

[25] Jonathan A. Bernard, "Minimalism, Postminimalism, and the Resurgence of Tonality in Recent American Music," *American Music* 21, no. 1 (Spring 2003): 130. Emphasis is the author's own. Bernard offers his own criteria for postminimalist composers, but does not go beyond stating that such music must demonstrate the clear influence of minimalism, either from the composer's earlier works or from the height of minimalist composition. Yet by the quoted statement he admits that his own criteria and their applications are incomplete and not definitive. Likewise, his rejection of the application of the term to composers such as Janice Giteck, Mary Jane Leach, and Beth Anderson (composers whom Gann includes explicitly in other writings) is based on what he admits to be subjective interpretation of the level of minimalist influence and not on any other aesthetic or functional criteria.

[26] Adam B. Silverman, "Stylistic Combination and Methodical Construction in William Duckworth's *Southern Harmony*," *Contemporary Music Review* 20 (2001): 45-59; Walter Frank, "The Piano Music of William Duckworth," (M.A. thesis, Wesleyan University, 2005); John Solomon, "The Six Piano Sonatas of James Sellars: Aspects of Form, Rhythm, Texture, and Style," (D.M.A. diss., University of North Texas, 2003).

"Metametrics, Postminimalist Version," which looks at the music of Paul Epstein, and "Postminimalism: Chapter One, Metaphorically Speaking," which considers music by Duckworth, Janice Giteck, and Melinda Reynolds.[27]

Time

Given the state of current research with minimalism and postminimalism, two issues need to be addressed. First, minimalism's focus on audible process makes meaningful analysis difficult as composers deliberately sought to lay bare all the elements of their music before the listener, leaving little for analysis to address. Moreover, it is difficult for formalist analysis adequately to describe the listening experience, which was of primary concern for these composers. Second, the distinction between minimalism and postminimalism has not been adequately addressed. Given the currency of the term postminimalism and limited published analysis, this lack is not unexpected, but it is important that the distinction between the two terms continue to be clarified if postminimalism as a term is to become more widely accepted. To resolve both of these issues the most profitable avenue is to consider the relationship these pieces have with musical time.

Music exists in time, and the experience of music is based largely on its interaction with this medium. As Rochberg puts it, music "arises spontaneously in every culture from the action of an autonomous, deeply intuitive sense of time on a fundamental reality of the

[27] Kyle Gann, "Metametrics, Postminimalist Version," PostClassic, entry posted 19 February 2006, http://artsjournal.com/postclassic/2006/02/metametrics_postminimalist_ver.html (accessed 2 Aug 2010); "Postminimalism: Chapter One, Metaphorically Speaking," PostClassic, entry posted 28 May 2007, http://artsjournal.com/postclassic/2007/05/postminimalism_chapter_one_met.html (accessed 2 August 2010).

physical universe. . . . Man's rhythmic energies . . . are inextricably bound up with this ability to create time in music."[28] To put it even more simply, "Without time, there is no music."[29] The intrinsic interaction of sound and time, while intuitively understood by even casual listeners, is not often addressed explicitly in theoretical analyses or in applied music instruction. Scholarship of the last few decades had done much to correct this oversight, though the focus tends to be either on common practice music or on music of the first half of the twentieth century. Minimalist music, tends to receive less attention despite the remarkable implications of its interaction with time, and postminimalism is almost entirely ignored. Before turning to the specific implications within these genres, it is useful to first introduce some of the basic concepts of musical time as groundwork for the discussion that follows.

Linear Time

Consider the opening eight measures of the first movement of Mozart's Sonata in A major, K. 331 (example 1.1). These measures can be understood as a parallel period with a half cadence in measure 4 and a perfect authentic cadence in measure 8. Yet even this simple construction has many different levels of interaction with time; the sequencing in the first two measures by itself has multiple implications. This sequence activates the listener's memory of the first measure while he or she is hearing the second, a gesture that carries with it expectations for the future. When it is repeated, this motive in the soprano voice, with

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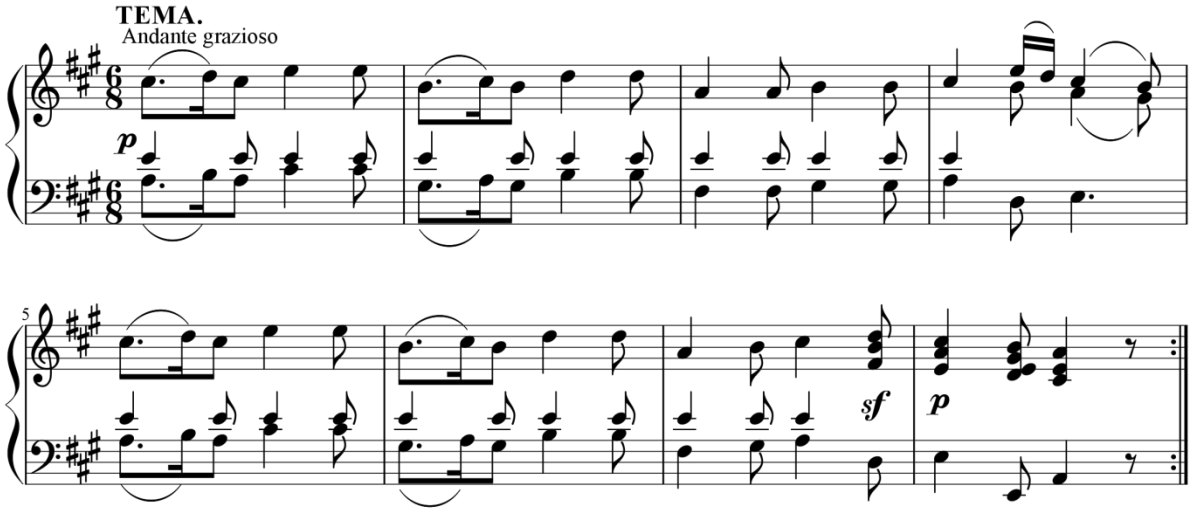
[28] George Rochberg, 136.

[29] Alan Marsden, *Representing Musical Time: A Temporal-Logical Approach* (Lisse: Swets & Zeitlinger, 2000), 1.

assistance by the bass, is marked for consciousness in terms of its rhythmic and melodic profile, potentially signaling it as important to the remainder of the section or even work as a whole. Likewise, the downward motion of the sequencing also establishes expectations for the possible direction of the rest of the phrase, which may or may not be fulfilled immediately.

Example 1.1. W. A. Mozart's Sonata in A Major, K 331, measures 1-8 (Leipzig, Breitkopf & Härtel, 1877-1910), 118. Public Domain.



The phrase-level implications demonstrate interaction with time even more clearly. The half cadence in measure 4 sets up an expectation for the listener that its tension will eventually be resolved. This resolution is delayed by the start of the second phrase, which begins exactly as the first. It is easy to become confused at this seeing the tonic chord in measure 5 as the resolution of the dominant in measure 4. But your ears tell you that measure 5 is not related to the half cadence but rather to the start of the first phrase—it is not

resolution that occurs but instead an activation of memory. When hearing measures 5-6, your mind is running a comparison between what is happening in present and the memory of the first phrase while at the same time expecting differences between the two to occur. As those changes happen in measure 7 and movement toward a cadence begins, the expectation for a resolution of the previous half cadence increases until it is fulfilled with a perfect authentic cadence in measure 8, completing the parallel period.

There are of course other ways to look at this excerpt with respect to time beyond the use of motive and phrase construction. For instance, Mozart uses melody, harmony, and melodic and harmonic rhythm to create expectation for both of these cadences and to establish the four-measure norm for phrase lengths. Naturally, these examples highlight some of the most basic aspects of common practice music, but what is important is that even with such simple concepts and, in this case, a relatively short excerpt, the interactions between past, present, and future can quickly become complex. On the level of a complete movement or piece, the music creates an elaborate network of musical time that operates on multiple hierarchical levels simultaneously.

Understanding the drama or narrative of the music, is directly linked to this network of interactions. As Jann Pasler puts it, "to follow a narrative in music as in literature, one must develop expectations from the work's implications, use one's accumulated memory of its events to comprehend . . . and pay attention to understand what comes next. . . . A work's narrativity then sets the stage for the communication of meaning."[30] For music to be goal-

[30] Jann Pasler, "Narrative and Narrativity in Music," in *Time and Mind: Interdisciplinary Issues*, edited by J. T. Fraser (Madison, CT: International Universities Press, Inc, 1989), 244-245. The terms narrative and narrativity are rather loaded and have

oriented or to have narrative meaning, it therefore must engage the listener "through a multiplication of the effects of accretion and cause-and-effect relationships."[31] In the context of this view, it is not surprising that nearly all Western music, despite its vastly different approaches to the creation of musical time, tends to move forward through time.[32] This is not to say that Western music strives ever forward without looking back or diverting in other directions. In the case of the Mozart example, the start of the second phrase acts to delay the expected motion to tonic by looking back to material already presented, while at the same time continuing to stress the importance of the opening motive through repetition. Still, the overall sense of direction continues to be primarily linear.

Kramer defines linearity as, "the determination of some characteristic(s) of music in accordance with implications that arise from earlier events in the piece."[33] This concept of linearity in music is closely linked to Western culture, in which the idea of time being linear continues to be the dominant view, despite other lines of thinking, particularly in the fields of physics and philosophy.[34] Moreover, the concepts of "before" and "after," which are inherent

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many implications in and of themselves. They are used in this context primarily because they are, defined by Pasler in the context of music specifically in terms of interaction with the past, present, and future, thus making them applicable here.

[31] Rochberg, 143.

[32] Kramer, 20.

[33] Ibid, 25.

[34] Brent D. Slife, *Time and Psychological Explanation* (Albany: State University of New York Press, 1993), 25.

to memory and the mind,[35] are so powerful that some have argued that time itself should be considered anisotropic.[36] Still, it is not just the direction of time that is important in Kramer's definition, but also teleology—that what is being heard in the present is somewhat defined by events that occurred previously and anticipation of the future is both possible and important. Granted, musical linearity and its implementations have varied widely between eras of music history and even individual composers, causing Kramer and others to consider several subspecies of linear time in their analyses. Yet even with such variance, linearity is so entrenched in Western music that it is in many ways the *de facto* perspective when it comes to listening, performance, analysis, and even composition.

Vertical Time

While linearity remained dominant in nineteenth century compositions, composers were moved away from this norm as the century drew to a close such as in Wagner's "Prelude" to *Das Rheingold*, with its extended opening E-flat chord, and Satie's *Vexations*, with its extreme repetitions.[37] By the early twentieth century, composers began explicitly trying to thwart linearity in a variety of ways,[38] and one of the first to discuss this change was Leonard Meyer, who described such music as "directionless, unkinetic" and "anti-

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[35] J. T. Fraser, *Of Time, Passion, and Knowledge* (Princeton: Princeton University Press, 1975), 249.

[36] K. G. Denbigh, "In Defense of *the* Direction of Time," in *The Study of Time*, edited by J. T. Fraser, F. C. Haber and G. H. Müller (New York: Springer-Verlag, 1972): 157.

[37] Strickland, 124.

[38] Cristensen, 50.

teleological."[39] He went on to write that "because it presents a succession rather than a progression of events, this art is essentially static. There are no points of culmination or focus. All events are equally important and time, as we ordinarily conceive it, dissolves. There is only duration."[40]

Pasler likewise recognized this development, though without Meyer's stern critiques, and by contrasting it with the narrative of common practice music, she developed several classifications for these types pieces:

> Antinarratives are works which rely on the listener's expectation of narrative, but frustrate it through continual interruption of a work's temporal processes. . . . Nonnarratives are works that may use elements of narrative but without allowing them to function as they would in a narrative. . . . A third type of innovation [nonnarrativity] constitutes works without narrativity, those that shun any organizing principle, whether an overall structure or preordained syntax, and thereby try to erase the role of memory.[41]

Pasler's classifications demonstrate how composers thwarted linear time in vastly different ways. Stravinsky and Stockhausen trended more toward antinarratives, which Kramer refers to as "multiply-directed time" or "moment time,"[42] while many Cage works may best be associated with nonnarrativity due to chance elements. Minimalist works fall under the second classification of nonnarratives, yet due to their stark contrast with linear time, Kramer goes beyond Pasler and describes these pieces as existing in vertical time—"a single present

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[39] Leonard Meyer, *Music, the Arts, and Ideas: Patterns and Predictions in Twentieth-Century Culture* (Chicago: University of Chicago Press, 1967, 1994), 72.

[40] Meyer, 81.

[41] Pasler, 244-248.

[42] Kramer, 50-52.

stretched out into an enormous duration, a potentially infinite 'now' that nonetheless feels like an instant."[43]

Before addressing the link between minimalism and vertical time, it is important to understand what makes vertical time distinct from these other varieties of linear-thwarting time. As Pasler defines it, antinarritves still rely on and employ some principles of linear music, but either through discontinuities or completely self-contained moments, these works never settle into a standard narrative structure. Thus memory and expectation remain somewhat relevant to this particular species of time. Nonnarrativity is more akin to vertical time as the rejection of organization makes memory and expectation irrelevant to a certain degree. The musical experience occurs strictly in the present as events are not determined by anything that has come previously and accurate anticipation is not rationally possible. What makes nonnarrative music distinct from the vertical time of minimalism is that in minimalism memory and expectation remain largely irrelevant precisely because either it is unchanging or it is changing at a very slow, predictable rate, thus creating a sense of "timelessness . . . or eternal time."[44]

Vertical Time and Minimalism

The concept of vertical time is often applied to minimalism largely because it helps to resolve a paradox that arises while listening to such music. In an article from 1972, Tom Johnson described these early works:

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[43] Kramer, 55.

[44] Christensen, 49.

> The form of their [Young, Reich, Riley and Glass] pieces is always flat. They are not interested in building to climaxes, or in manipulating tension and relaxation, or in working with large contrasts of any kind. They keep their music flat, never allowing it to rise or fall above a certain plane. . . . The term "static" is often used in reference to their music, since it never leaves this one level and never seems to be moving toward anything.[45]

The stasis that he describes certainly seems to be an accurate representation of minimalist music, yet it is not often literally static or unchanging. By developing the term "vertical time," Kramer is able to describe more accurately the listening experience than Johnson.

> Because in such pieces the motion is unceasing and its rate gradual and constant, and because there is no hierarchy of phrase structure, the temporality is more vertical than linear. The motion is so consistent that we lose any point of reference, any contact with faster or slower motion that might keep us aware of the music's directionality. The experience is static despite the constant motion in the music.[46]

The listening experience, based in vertical time, becomes almost entirely present-oriented. Once it becomes obvious that this music does not behave according to the normal expectations of common practice music, a new kind of listening emerges, one that allows the listener to focus freely on different aspects of the music with little respect as to where it came from or where it might be going. This experience is far from an arbitrary effect of the compositional process, however, as the composers seem to have had this outcome specifically in mind. As Philip Glass wrote concerning his *Music in Twelve Parts* (1971-1974):

> The music is placed outside the usual time-scale substituting a non-narrative and extended time-sense in its place. . . . When it becomes apparent that nothing "happens" in the usual sense, but that, instead, the gradual accretion

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[45] Johnson, "La Monte Young, Steve Reich, Terry Riley, and Philip Glass."

[46] Kramer, 57.

> of musical material can and does serve as the basis of the listener's attention, then he can perhaps discover another mode of listening – one in which neither memory nor anticipation . . . have a place in sustaining the texture, quality or reality of the musical experience.[47]

Not only did composers deliberately seek to make the structure and elements of their music transparent, but they also intended for a free exploration of the music as well.

An understanding of vertical time also helps to explain the dissonance that can occur between the musical time of a minimalist composition and the more objective clock time. When engaged with minimalist music, the listener experiences what has already been described as timelessness; a single moment becomes extended to an almost "infinite now." The extremely gradual rate of change with minimalism draws attention to minute details, which in turn affects the perception of time. Stefan Klein describes the effect, "Once we recognize the value of a moment we are experiencing, we try to savor every aspect of it. Sense and memory are highly receptive, and every impression they absorb slows down the time we are experiencing. The effect is even more dramatic when we focus on the very smallest changes."[48] Michael Flaherty, through studies on altered experience of time has derived five sequential factors common that produce this effect, which he refers to as protracted duration.

> First, there is a context that is characterized by *extreme circumstances*. The situations that engender protracted duration fall into one of two categories: those with unusually high levels of overt activity, and those with unusually low levels of overt activity. . . . Second, when people are confronted with extreme circumstances, they experience an increased *emotional concern* for

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[47] Wim Mertens, 79.

[48] Stefan Klein, *The Secret Pulse of Time*, trans. Shelly Frisch (New York: Marlowe and Co., 2006), 68-69.

> understanding the nature of their situation. . . . In other words, the individual cares deeply about the situation and his or her place in it. Third, the shock of transition to extreme circumstances heightens *cognitive involvement* with self and situation. . . . Fourth, heightened perspicacity towards one's own subjectivity and surroundings generates *stimulus complexity* even if the setting is not characterized by a wealth of overt activity. . . . Fifth, increased stimulus complexity fills standard units of temporality with a *density of experience* that far surpasses their normal volume of sensations.[49]

In the context of these factors, it is clear how minimalism is able to create a sense of protracted duration. The extremely low level of overt activity encourages a heightened awareness, particularly of small details, which in turn creates a sense of time lengthening.

This interpretation of vertical time in minimalism, however, seems to contradict a common experience—that a composition feels as though it was far shorter than the clock indicates, not longer as protracted duration might indicate. Flaherty refers to this effect as temporal compression, and notes that it is purely "a facet of retrospection. In contrast with protracted duration and synchronicity, both of which are primarily phenomena of the present, temporal compression is uniquely associated with the past."[50] Anytime you make an evaluation of how much time has passed, it requires a recollection of the past, not an experience of the present. It is not surprising, given the reduced activity within the large time span of a minimalist composition, that it feels as though little time has actually elapsed when evaluated afterwards, even when the experience of the present during the piece felt elongated. Other types of pieces that produce vertical time do not necessarily produce this same combination of protracted duration and temporal compression, making this

[49] Michael G. Flaherty, *A Watched Pot: How We Experience Time* (New York: New York University Press, 1999), 91-95.

[50] Flaherty, 104.

combination a distinct characteristic of minimalism. Kramer describes a happening in which many different types of experiences, musical and otherwise, were presented simultaneously, creating an "extravagant embodiment of vertical time. . . [Yet] what had seemed like a two-hour performance must have lasted under 25 minutes."[51] Therefore, while both the vertical time of minimalism and this happening produced protracted duration, only minimalism also created a sense of temporal compression in retrospect.

Time and Postminimalism

The understanding of time in postminimalist music is somewhat trickier given the influx of various influences in addition to minimalism. Metric and rhythmic hierarchies, melodic implications, harmonic motion, and phrasing and form, which all can contribute to linear time, are characteristic of postminimalist music alongside many of the characteristics that created vertical time in minimalism. The implications of these linear elements tend to be weak, non-teleological, and ineffectual. Naturally, this combination creates a problem when trying to describe the listening experience. The combination of musical elements that generate either linear or vertical time can create moments that may activate memory and expectation, the past and future, only to later thwart that interpretation entirely. While it is possible to argue that most postminimalist pieces create a sense of linear time due to the resurgence of these elements, it is not necessarily the best way to understand these pieces and the musical time they create. To achieve a more accurate understanding would require a combination of linear and vertical time experience, either combined as a hybrid or on different hierarchical levels, which is difficult given that these two terms seem to be mutually

[51] Kramer, 380.

exclusive—that any linearity necessarily negates the possibility that a piece may exist in vertical time.

These terms are considerably more fluid than they seem, however, precisely because time is directly related to personal experience. As Iannis Xenakis and Roberta Brown write, time "has signification only in relation to the person who observes,"[52] and therefore, as J. T. Fraser concludes, "time refuses to conform to the law of contradiction."[53] If time is not bound by the law of contradiction, then it is possible for both linear and vertical time to exist simultaneously in a single piece of music. Kramer acknowledges this notion when he writes that "these categories of time are not complementary; they are not always comparable; they readily overlap; and, because time is exempt from the law of contradiction, they can coexist."[54] This fact may seem counterintuitive, but by allowing a more flexible interpretation and overlapping of these seemingly discrete categories of time it is possible to gain a greater understanding of how postminimalist pieces create musical time.

Such analyses of postminimalist music would require an understanding of the specific musical elements that create linear time and those that create vertical time (the latter of which has been largely neglected in literature) to address any possible interactions between the two. This analytical approach has important implications for minimalist music as well. For

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[52] Iannis Xenakis and Roberta Brown, "Concerning Time" Perspectives of New Music, Vol. 27, No. 1 (Winter, 1989): 87.

[53] Fraser, 45. Aristotle, the first to try to prove the law of contradiction, defines it as such: "The same attribute cannot at the same time belong and not belong to the same subject in the same respect—presupposing, of course, such qualifications as may be necessary to guard against logical objections." *Aristotle's Metaphysics*, trans. John Warrington (Alcester: Read books, 2007), 123.

[54] Kramer, 8.

instance, if a process-driven minimalist composition sets up localized climaxes or expectations while also having large-scale closure, it would by strict definition no longer be creating vertical time. Yet, if within the same piece the repetition, limited musical material, and extremely slow progression created an overall effect of an extended present, it would hardly make sense to negate its verticality even if there may be a few linear elements within the piece. Therefore, its musical time may be linear on one hierarchical level and vertical on another, which is a considerably more complete description of the listening experience than trying to understand the piece through the lens of only one species of time.

Therefore, given that time is not subject to the law of contradiction and that linear and vertical time can coexist within a single piece, it is crucial that this possible interaction be considered when analyzing the musical time created by minimalist and postminimalist pieces. In doing so, it will become clear that while both genres often interact with linear and vertical time, the musical time created by each is distinct, which further articulates the differences between the two. Moreover, this analytical approach is also capable of describing the richness of the listening experience created through such simple musical means.

To this end, it will first be necessary to define what specific musical elements contribute to vertical time in minimalism through analysis of early keyboard pieces by Riley, Reich, and Glass in Chapter 2. The results these analyses will then be incorporated into a large-scale exploration of Tom Johnson's *An Hour for Piano* (1971) in Chapter 3, demonstrating the possibilities of interaction with linear time in a piece that is overwhelmingly vertical. Turning to postminimalism in Chapter 4, individual elements of

linearity are considered as they are more prominent in this genre, but are still weakened by elements of verticality borrowed from minimalism. As was done in Chapter 3, Chapter 5 will contain a large-scale analysis of David Borden's *Double Portrait* (1987), a composition that begins in near-vertical time, but gradually shifts to almost purely linear time by its conclusion. Finally, Chapter 6 will summarize these conclusions, reaffirming the ability of this analytical approach to describe accurately and more fully the listening experience of minimalist and postminimalist pieces as well as highlight the distinctiveness, and thus the relevance, of postminimalism as a genre.

CHAPTER 2

LINEAR AND VERTICAL TIME IN MINIMALISM

Composers and theorists largely agree that minimalist music creates vertical time. However, the scholarly focus on the creation of vertical time has often led to the tacit belief that minimalist music does not feature linear musical elements. Jonathan Kramer mentions the lack of phrasing, or at least phrasing that refuses to organize into largely hierarchical levels as a sufficient cause of vertical time.[1] Tom Johnson describes how supposedly non-manipulative minimalist pieces create a vertical listening experience when he writes, "They did not try to manipulate me or ring any Pavlovian bells, and they did not struggle to hold my attention. They simply said what they had to say, leaving me free to listen or not listen, and respond in my own way."[2] Iannis Xenakis and Roberta Brown simply discuss the absence of change as sufficient cause. "If events were absolutely smooth without beginning or end, and even without modification or 'perceptible' internal roughness, time would likewise find itself abolished."[3] Perhaps these explanations stem from the nature of pieces that create vertical

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[1] Jonathan Kramer, *The Time of Music* (New York: Schirmer Books, 1988), 55

[2] The term "vertical listening" is borrowed from Paul Epstein, "Re: Postminimalist Piano Pieces.1," Personal email, 8 November 2007; quote from Tom Johnson, "Shredding the Carrot Climax" in *The Voice of New Music* (Eindhoven: Apollohuis, 1989), [PDF version online] http://www.editions75.com/Books/TheVoiceOfNewMusic.PDF (accessed 19 May 2010): 53.

time, which often exclude musical elements integral in common practice music. Still, the creation of vertical time in minimalist piano music is not accomplished by omission only, but also is created actively by repetition, pulse, and audible structure.

Sources of Vertical Time

Repetition is "perhaps the most stereotypical aspect of minimalist music, the tendency that audiences superficially associate with its stuck-in-the-groove quality."[4] One reason so many composers employed repetition is that it is one of the most powerful tools for destroying traditional meaning in favor of creating vertical time. Meaning, whether in words or in music, is heavily influenced by the variety of contexts that accompany any dialogue. As the following examples show, repetition is capable of drastically altering the context in which the information is received. Initially, the receiver takes a particular meaning from a series of words or a musical gesture, but as it gradually becomes clear that it may be repeated indefinitely, any linear implications become irrelevant. It is no longer germane to anticipate what the next phrase (linguistic or musical) may be, and thus the context is reoriented from the linear to the vertical, forcing the receiver to consider the information differently.

Several pieces demonstrate this point through their use of language to create musical effect, such Steve Reich's *Come Out* (1966) and David Borden's *Music* (1972). *Come Out* is based on a recording of Daniel Hamm, who had been beaten in a Harlem police precinct house. "I had to like open the bruise up and let some of the bruise blood come out to show

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[3] Iannis Xenakis and Roberta Brown, "Concerning Time" Perspectives of New Music, Vol. 27, No. 1 (Winter, 1989): 87.

[4] Kyle Gann, "Minimal Music, Maximal Impact," New Music Box, 1 November 2001, http://www.newmusicbox.org/page.nmbx?id=31tp05 (accessed 3 June 2010).

them."[5] These last five words became the ostinato for Reich's phasing and canonic processes, and through repetition, these words completely lose their meaning as language is stripped down to nothing more than rhythm and sound. A similar transformation takes place with Borden's piece *Music*. Here Borden samples a recording of the song "Music! Music! Music!" (1949) written by Stephen Weiss and Bernie Baum. The song begins "Put another nickel in / In the Nickelodeon / All I want is loving you / And music, music, music." Borden loops this last word continuously for the duration of the 13-minute piece, and it becomes the rhythmic and harmonic basis of the work. Again, whatever meaning this word had, both as language and as music, becomes completely changed through extensive repetition.

The power of repetition extends beyond language, and can create vertical time even with melodic lines and harmonic progressions. Kramer describes such an experience when attending a performance of Satie's *Pages mystiques* (1893), which has as its middle movement the 840 repetitions of *Vexations*:

> Whatever linearity is inherent in the four phrases soon gives way, after numerous repetitions, to an extended present in which the music neither grows out of earlier events nor implies later events. When I first entered the concert, I listened linearly. But I soon exhausted the information content of the work. It became totally redundant. . . . But then I found myself moving into a different listening mode. I was entering the vertical time of the piece. . . I was no longer bored. And I was no longer frustrated, because I had given up expecting.[6]

What is interesting about this narrative is that Kramer did not immediately move into a vertical listening experience, but instead listened to the piece in a traditional way until

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[5] Steve Reich, "Early Works (1965-68)" in *Writings on Music: 1965-2000*, ed. Paul Hillier (New York: Oxford University Press, 2002), 22.

[6] Kramer, 379.

repetitions made that irrelevant. Since the musical material in the work does have linear implications, this becomes the default listening approach; it is not until it becomes evident to the listener that nothing happens that a vertical listening experience can take over.[7]

Pulse is another important generator of vertical time, and it is particularly relevant to piano music due to the instrument's inability to sustain pitches for a significant amount of time. Pulse is found in all common practice music as it is necessary for meter. It need not be overtly present in the music (though it often is) as the listener can easily derive it from the piece's rhythmic organization. What differentiates pulse in minimalism as opposed to common practice music is that composers articulate it with a steady, often invariant rhythm—it does not act as a baseline for higher level of organization. Moreover, pulses are rarely grouped beyond the metrical level, and even then metrical ambiguities are not uncommon. With this musical element brought to the forefront and limited it to its most basic uses, it helps create a sense of vertical time. "Pulse and goal-directed movement evoke two kinds of temporal experience which are qualitatively different. . . . Continuous pulse time can be related to the omnidirectional time of being, as continuous pulse has no definite beginning and end."[8]

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[7] As Mertens points out, "repetition in repetitive music is technically identical to repetition in traditional music. The only difference is the context in which it is used." Thus, repetition, in order to create vertical time, must be sufficient, otherwise linear elements are not entirely thwarted. Wim Mertens, *American Minimal Music* (New York: Alexander Broude, Inc, 1983), 123.

[8] Erik Christensen, *The Musical Timespace: A Theory of Listening*, Vol. I (Aalborg: Aalborg University Press, 1996), 14, 50.

A third source of vertical time in minimalism is audible structure, which is perhaps the most important factor in vertical time creation.[9] Repetition and pulse are essentially static, so to maintain vertical time while still allowing for some level of change requires an audible structure. Change can easily create linear time, but with audible structure the effects are minimized. Reich's statement that, "once the process is set up and loaded it runs by itself,"[10] is a natural fit for audible structure, but other, less rigorous pieces still have this characteristic. Tom Johnson describes audible structure as being where "the pitches, rhythms, and colors presented in the first few minutes usually define a specific kind of music, and the remainder of the piece will not depart very far from that."[11] A piece does not need to be completely predictable so much as the material must lie "right on the surface."[12] This level of transparency allows the listener to ignore memory and anticipation and focus on the present, where, as Glass wrote, "the attention of [the] audience is mainly drawn to the sound itself."[13]

Composers use a variety of means to achieve audible structure, allowing for different levels of predictability as well as possible interactions with linear time. Likewise, repetition

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[9] Kyle Gann places such importance on this factor that he even defines minimalism as "The Era of Audible Structure, 1960-1980," in "Minimal Music, Maximal Impact."

[10] Steve Reich, "Music as Gradual Process," in *Writings on Music: 1965-2000*, 34.

[11] Tom Johnson, "La Monte Young, Steve Reich, Terry Riley, Philip Glass" in *The Voice of New Music*.

[12] Gann, "Minimal Music, Maximal Impact." Gann even explicitly mentions pieces such as Riley's *In C* (1964) and Glass's *Einstein on the Beach* (1976) as having audible structure.

[13] Philip Glass, quoted in Mertens, 71.

and pulse are employed in diverse ways and may at times interact with elements of linear time. Therefore, these three elements can create different qualities of vertical time by varying implementations and interaction with linear time, which can most easily be seen in three classic piano works—Terry Riley's *Keyboard Study no. 1* (1964), Steve Reich's *Piano Phase* (1966-67) and Philip Glass's *Two Pages* (1969).

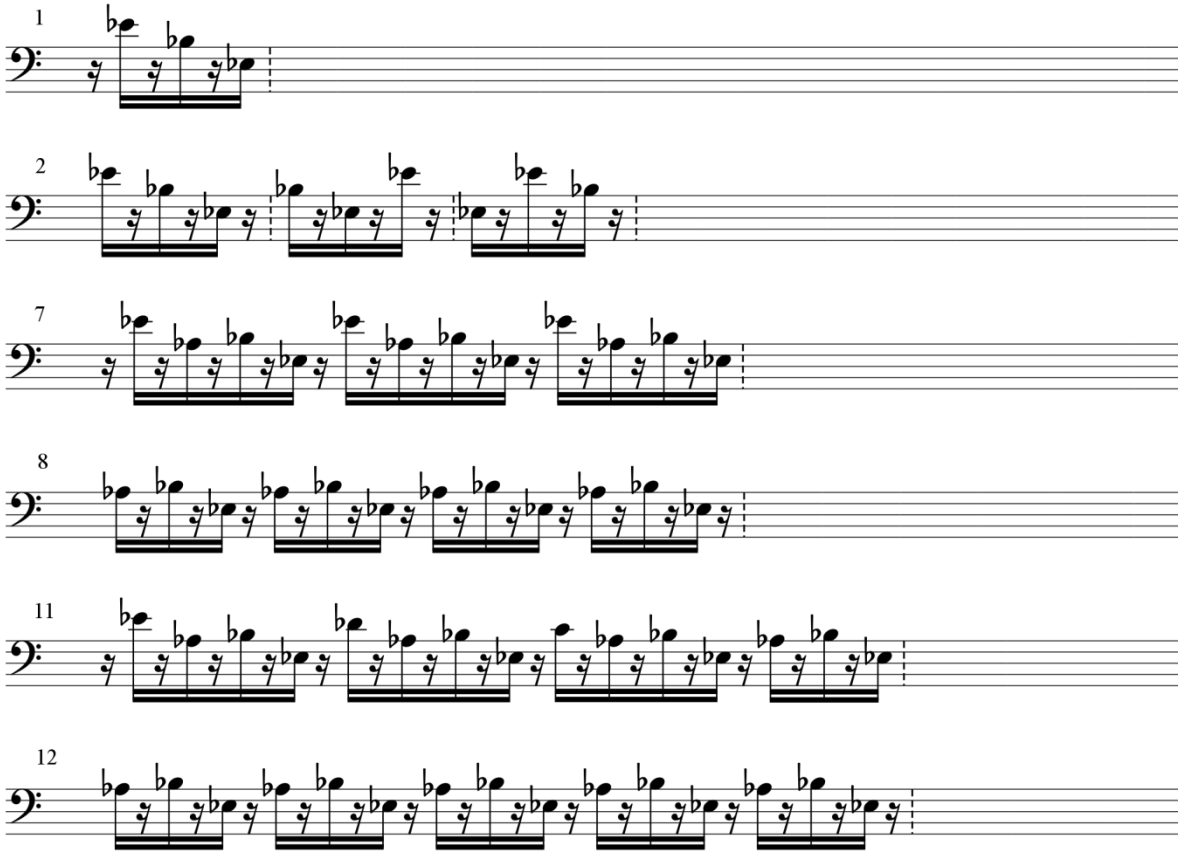
Terry Riley's Keyboard Study no. 1

The *Keyboard Studies* share similarities with one of Terry Riley's most well known works, *In C* (1964), as both rely on elements of improvisation and the use of discrete musical phrases or modules. *In C*, which consists of 53 modules to be played by an unspecified ensemble, quickly became a seminal minimalist composition. The players move at their own pace through the composition, even skipping modules, making each performance unique. Many of the same compositional principles can also be found in the *Keyboard Studies*, and while most were premiered on the same series of concerts as *In C*, they have received much less attention. This is largely because only the first two of the *Studies* is fully notated, and even then the score for the first has only become widely available in recent years. The first of the *Keyboard Studies*, which is also known as *Coule*,[14] is a series of sixteen short modules, varying in length from three to twelve notes and presented in three sections without break. Modules one, seven, and eleven each begin with a sixteenth-note rest so that the performer plays them simultaneously with the other modules of the piece, repeating the combinations

[14] "A pun on the French word for 'flowing' or 'gliding,'" Keith Potter, *Four Musical Minimalists* (Cambridge: Cambridge University Press, 2000), 123.

an indefinite number of times (example 2.1). The order in which these modules proceed, however, allows for a great deal of improvisation.[15]

Example 2.1. Terry Riley's *Keyboard Study no. 1* (Self published, ca. 2002), modules 1-2, 7-8, and 11-12. Modules 1, 7, and 11 are the primary ostinati for the piece. Score excerpt printed with permission, Terry Riley.



[15] Potter describes the modules as proceeding in numerical order based on the only sketches that were available at the time of publication of *Four Musical Minimalists*. The published score, available since 2002, contains additional instructions upon which this analysis is based.

There are fourteen performance steps that Riley includes with the score (of which eight are optional) and usually the performer can choose several different modules to play at each step. Ostinato modules are initially combined with other accompaniment modules from their section, i.e. module 1 is combined with a module from 2-6, after which point any of the accompanimental figures can become an ostinato to be paired with a different accompaniment pattern. Material from different sections can overlap, and over the course of the piece every module has the potential to be either an ostinato or accompaniment figure. The only regularity to the piece is which sections are being heard at any given time. Here, a structure does emerge, where the piece divides into six parts using the following sections: A, B, A/B, C, A/B/C, and ostinatos alone.

Even within this structure, vertical time largely governs the listening experience. By presenting a continuous stream of notes with different module lengths, Riley creates a great deal of metrical ambiguity. Only the modules in the first section are exclusively grouped in units of three, but the establishment of a downbeat is still difficult given the ordering of pitches in modules 2-6. Moreover, the modules in sections two and three have groupings between two and four notes, further obscuring any sense of meter. This grouping tendency is especially apparent in the third section where there are fifteen notes per module, allowing for a variety of sub-groupings. This metrical ambiguity combined with the complete lack of rhythmic variation means that there is no sense of interplay between rhythm and meter, only continuous pulse, which creates vertical time. David Epstein explains:

> These many elements—metric and rhythmic, of various degrees of duration and level, each with its unique species of accent, all of them further enlivened by surface stresses—form a matrix of coordinated and uncoordinated intensities whose graduated degrees of tension and releases of tension drive

> the music forward. Inadequately established, thus imbalanced, these forces cannot effectively modulate forward drive.[16]

Likewise, since the similarity in pitch content between modules and indefinite repetitions of stage encourages listener freedom, the only constant throughout the piece is the pulse. Thus, the piece establishes "tiny eddies in the onflowing continuum from which any other sort of stress, or edge, is excluded. Within a completely static musical 'environment' is perpetual motion."[17]

Other potential sources of linearity, aside from interplay between rhythm and meter, are melodic and harmonic implications, but these linear elements are largely absent from *Keyboard Studies no. 1*. The piece uses pitches from a type of E^b scale,[18] but there is no significant movement away from this tonal area, creating a strong sense of stability. Any implications, to the extent they are present, are based on the movement from module combinations that contain dissonant intervals to combinations that are consonant, but the improvisatory nature of the work means that these are left to the performer's discretion. One such example of linearity might be in step 11, which reads, "If any figure from lines 2-6 is placed in the alignment of continuum figure one, (beginning with a [rest]), it may be

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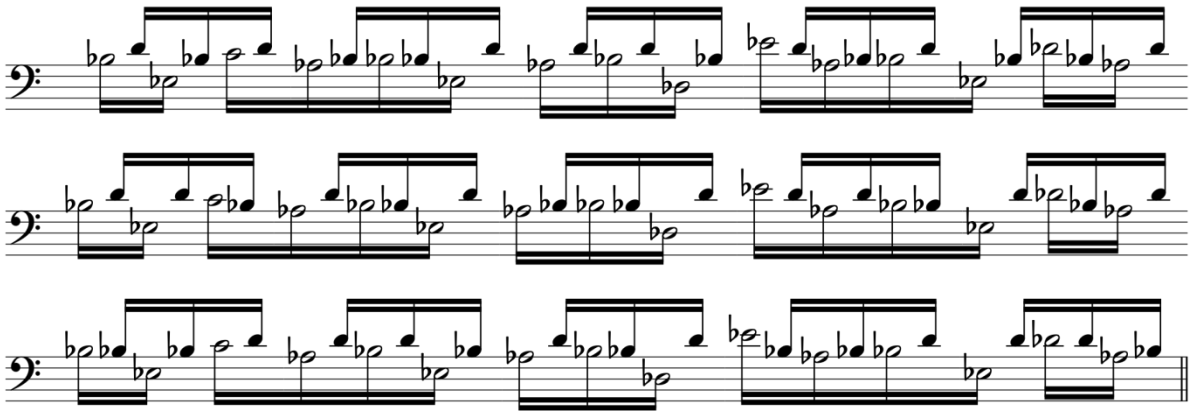
[16] David Epstein, *Shaping Time* (New York: Schirmer Books, 1995), 27.

[17] Michael Nyman, *Experimental Music: Cage and Beyond* (New York: Schirmer Books, 1974), 144-145.

[18] The complete set of pitches is E^b, A^b, B^b, C, D^b, and D. Without an F or G, the scale cannot be completely identified, and the inclusion of both the flat-seventh and leading tone further obscures the exact tonality. The justification for E^b as tonic is the strong emphasis of E^b and B^b throughout and the fact that the range of the entire piece is one octave, bordered by E^b's.

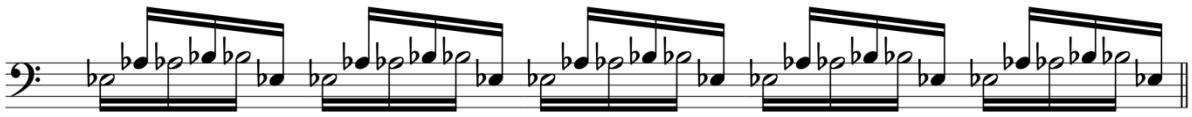
combined with any other figures from lines 12-16."[19] Here modules 4-6 might be combined with 13, 14, or 16, creating strong dissonances before resolving in step 12 to a combination of modules 8 and 15 (see examples 2.2 and 2.3). Of course, the opposite effect is also possible with different combinations of the same two steps. Moreover, when these implications do occur, they are weakened considerably through the multiple repetitions of each module, making it difficult to consider any such sources of linear time.

Example 2.2. *Keyboard Study no. 1*, realized combination prepared by the author of modules 5 and 16. Module 5 is presented with closed note heads and module 16 with open note heads. Module 5 is presented five times and module 16 three times to account for the differences in length between the two. All notes are natural unless otherwise indicated.



[19] Terry Riley, *Keyboard Studies* (Self published, c. 2002), 2.

Example 2.3. *Keyboard Study no. 1*, realized combination of modules 8 and 15. Module 8 is presented in closed note heads and module 15 in open note heads.



A similar problem arises when considering any linear implications of the work's form. While all three sections have slightly different pitch collections from one another, analysis concerning movement from one step to another cannot be adequately realized because not every module contains every pitch of the entire section. Also, the performer has the ability to skip steps if desired, or linger on a particular step for a significant amount of time, making any linear implications arising from form both difficult to hear and to analyze. Therefore, the sense of vertical time is strong throughout a hearing of this piece, and while individual performers may create localized instances of linear time through their module choices, these are significantly weakened by repetitions and a strong sense of pulse. Were the piece less improvisatory, it may be possible to consider greater levels of linear implications. Still, while linear implications in *Keyboard Studies no. 1* can only be discussed as a possibility, there are more concrete examples of linearity in a highly-structured piece such as *Piano Phase*.

Steve Reich's Piano Phase

The idea for *Piano Phase* stemmed from Reich's early involvement with tape music. Having already explored some of the possibilities of phase shifting in pieces such as *Come Out*, he wanted to get back to instrumental writing but was not optimistic about live

performers being able to realize the process. With tape, it was relatively easy to explore the possibility of one idea played against a slightly faster version of itself, gradually going out of phase, and as has already been mentioned, "once the process is set up and loaded it runs by itself."[20] It was not until he experimented with playing a piano against a tape loop that Reich found the possibility of live shifting reasonable, prompting a series phrasing compositions.[21] Structurally, *Piano Phase* is not wholly unlike *Keyboard Studies no. 1*. Both pieces are divided into three sections and each section has an ostinato figure presented against other material. Likewise, both pieces are written with a limited pitch vocabulary presented in continuous sixteenth notes. Unlike Riley's piece, however, the process is far more rigorous and aurally recognizable in *Piano Phase*. Rather than placing the ostinato against different melodic ideas, Reich has the line gradually phase with itself, or in the case of the second section, a modified version of itself, until every note combination is heard. This process creates a clear audible structure, but with strong connections with linearity.

Before addressing these linear implications, it is important to realize that any such impressions are secondary considerations to Reich. The primary focus of this work, as with his other early process pieces, is an aural exploration of the sounds and relationships created through each part of the process, with the phasing being a means to an end and not an end in itself. This can be seen in the range of repetitions Reich gives each stage of the phasing, with

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[20] Steve Reich, "Music as Gradual Process," 34.

[21] In this experiment, Reich recorded himself at the piano and then attempted to phase shift with the recording by gradually accelerating his own playing until he was slightly ahead before settling back into the original tempo. He then tried the same thing but with another performer instead of a tape and found the result to be musically effective. Steve Reich, "Piano Phase" in *Writings on Music: 1965-2000*, 22-24.

some stages being substantially longer than others. When asked by Michael Nyman about how he arrived at these decisions, Reich gave the following response:

> *Piano Phase* could take, if you are really tearing along, about 16 minutes, and if you're going incredibly slowly, 22 to 24 minutes. It's a pretty wide latitude. But, on the other hand, you can't play it in seven minutes or play it in an hour without hurting the music. . . . At a certain point, you've heard the relationship long enough to appraise it carefully, to appraise what the upper resulting patterns are, what the lower resulting patterns are, what the middle resulting patterns are, and it's time to change.[22]

Thus, Reich's concern for repetition is to get a sufficient amount of information from each step of the phasing and then to move on; he is more concerned that the process itself be audible and allow for vertical listening. He gives no indication that he is trying to propel the listener to the termination of the process, a return to the unison, but rather is clearly emphasizing the aural possibilities of each step in the process. If the focus of the composition was to be the overall arc of the phasing, there would need to be no more than a few repetitions at each stage to create a sense of musical momentum.

Furthermore, his description of the listening process for this piece is a perfect example of how one perceives music that exists in vertical time. Paul Epstein echoes this when he writes that the "mysteries" of this work "stem in part from the fact that while the process is continuous, our perception of it is not. The listener is presented with a rich array of possibilities out of which he/she may construct the experience of the piece."[23] Still, even with this focus on vertical listening, there remain three sources of linear implications in the piece that need to be considered in relation to the elements that create vertical time: the

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[22] Steve Reich, "Second Interview with Michael Nyman (1976)," in *Writings*, 96.

[23] Paul Epstein, "Pattern Structure and Process in Steve Reich's *Piano Phase*," *The Musical Quarterly* 72, no. 4 (1986): 497.

transitions between steps of the phasing process, the symmetrical form of each section, and the harmonic motion between sections.

The transitions within the phasing process have been most completely analyzed by Epstein in his article, "Pattern Structure and Process in Steve Reich's 'Piano Phase.'" Epstein notes that each transition goes through several stages: an increasing of acoustical resonance, a separation of the voices, a peak of irrational rhythmic complexity, and a doubling of tempo where the two parts are exactly half a beat out of phase, which is the brief midpoint of the transition.[24] Epstein goes on to analyze how some of the transitions behave differently than others, given their respective points in the phasing process, but what is consistent with each transition is that they are a source of linear time. While the structure of the piece remains completely audible, these transitions can create a feeling of ambiguity and instability with the listener, which is then resolved once the transition is complete. By creating a sense of tension, listeners begin to anticipate not only the resolution, but also the next phasing stage's sound, particularly in the second half of the transition. Each transition creates linear time on a localized level, despite the overall verticality of the piece, after which the listener must again settle back into vertical listening.

By the nature of the process, the listener never has to listen to any given stage for more than a minute,[25] which is to say that vertical listening is never required for long. As the

[24] Paul Epstein, "Pattern Structure and Process in Steve Reich's *Piano Phase*," 498-99.

[25] This assumes that the piece is 24 minutes long (Reich's stated upper limit for duration), that the transitions do not take any time, and that all stages take the same amount of time. In this case, each stage would last 45 seconds (24*60/32), though the actual durations would be shorter on average.

transitions between stages create linearity, the moment-to-moment listening experience fluctuates back and forth between these time constructs. The inherent similarity between stages allows the listener to shift back into vertical listening quickly, which is important given the brevity of each stage, creating a phenomenon that is notably different from purely vertical time. This understanding then adds to previous analysis by further being able to describe the richness of the listening experience that is not readily apparent from the simplicity of the structure.

On a larger scale, each phasing process also creates a clear symmetrical form as the second half of each is a retrograde of the first. Also, as there is an even number of notes for each figure phased, the number of phasing stages is odd. This leaves one central stage that is unique to each process, creating a clear midpoint and strengthening the symmetrical form. Keith Potter, in analyzing the piece with respect to Epstein's work, rightly concludes that this is "unlikely to be noticed by the listener."[26] Most listeners miss the symmetry because the large-scale vertical time created by the repetitions limits any perception of formal structure at this level; the similarities between stages obscure any linearity from one stage to the next. Still, by building on Epstein's analysis and carrying it through to the second and third sections of the piece,[27] an argument can be made for aural perception of the arch form as a source of linear time.

In order to more fully understand the nature of each stage of the phasing process, Epstein notated the two piano parts together for the first section of the piece (example 2.4).

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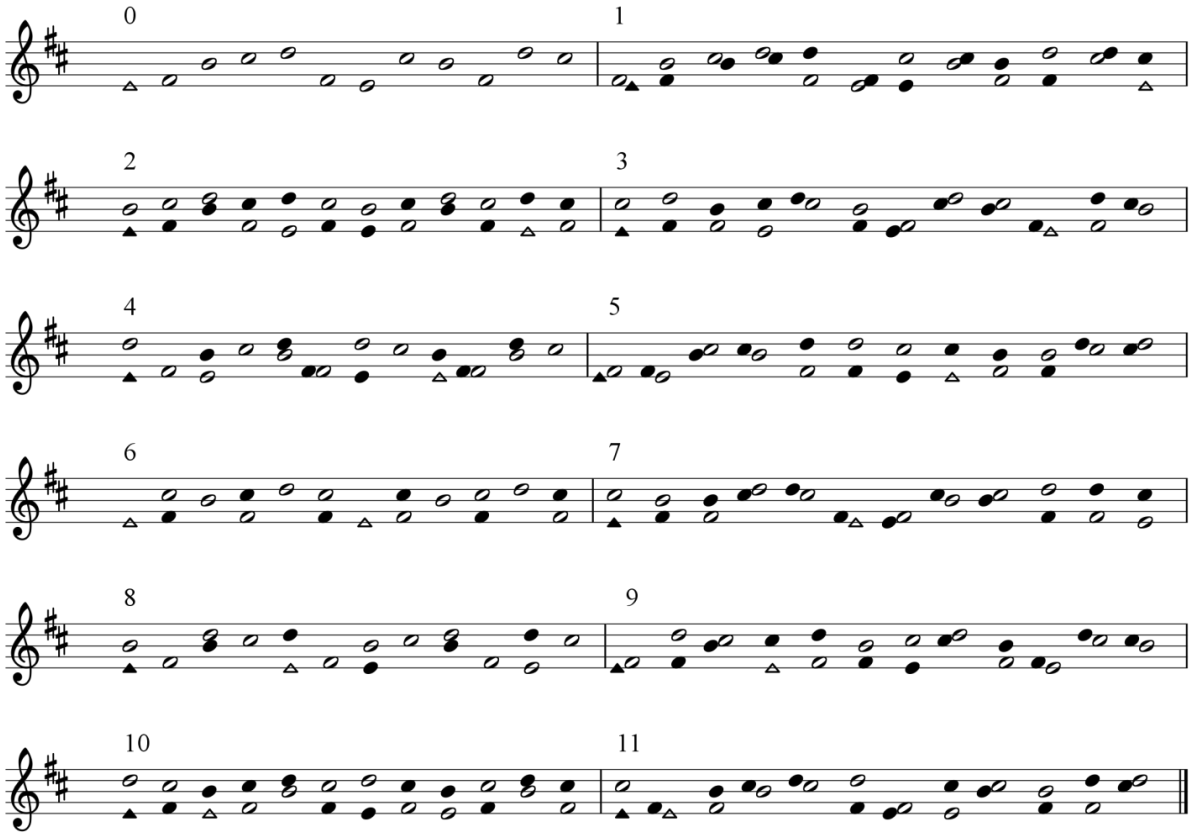
[26] Potter, 184.

[27] Epstien's analysis focused almost exclusively on the first section of the work. All examples and analysis of sections two and three are the author's own.

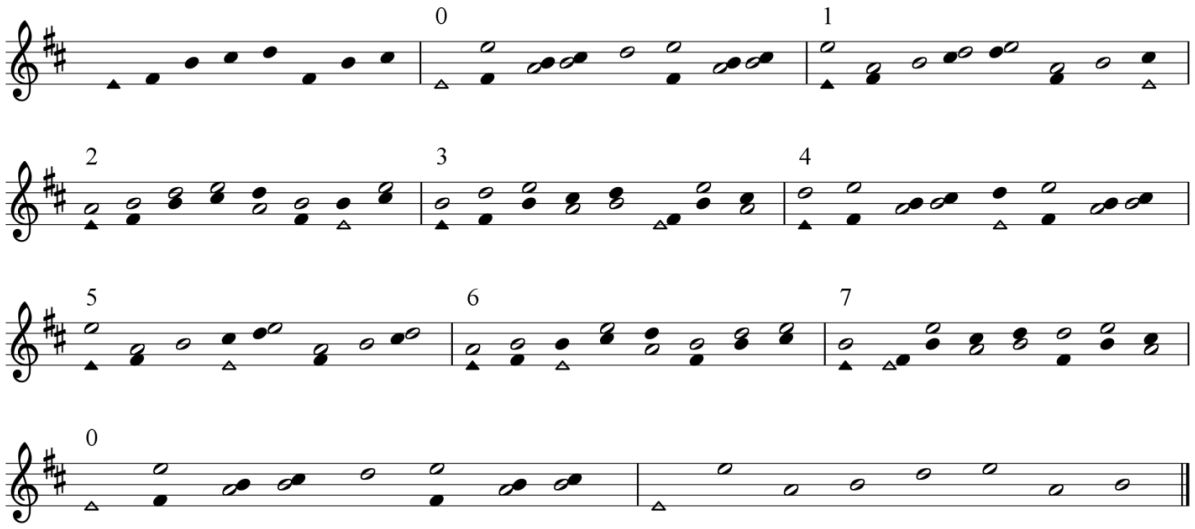
In this example, and in the examples for the second and third sections (examples 2.5 and 2.6), the filled-in note-heads represent the first piano part and the open note-heads represent the second piano part. Where the two parts are in unison open note-heads are used. To further illustrate the phasing, the first note of each piano part is marked with a triangle-shaped note-head. What Epstein noted in his analysis was that the odd stages of the first section consisted mostly of dissonant intervals while the even stages had mostly consonant intervals.[28] Still, while this back and forth may present a case for forward momentum, it must be understood that there is nothing about the dissonant stages that motivates a resolution to the consonant ones. Rather, any linearity is undermined as even the most dissonant stages become stable through repetition. This feature is unlike the transitions in the phasing process, each of which had a definitive end-point and clearly created a sense of tension and anticipation before resolving to the next stage. The transitions also operated on a much lower hierarchical level, where they were able temporarily to displace the overall verticality. This arch form, however, operates on a much higher level, meaning it would have to be more active linearly to affect the verticality. Thus, while the alternation between dissonant and consonant stages remains a valid observation for the second and third sections of the piece as well, it cannot be considered as an element of linearity at this hierarchical level.

[28] Paul Epstein, "Pattern Structure and Process in Steve Reich's *Piano Phase*," 496.

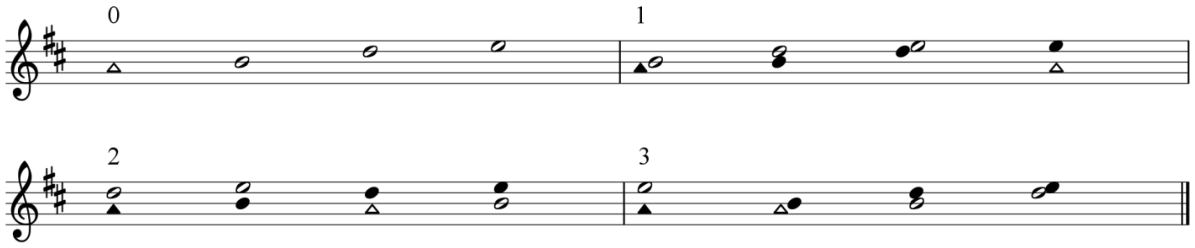
Example 2.4. Steve Reich's *Piano Phase*, analysis of section one, from Epstein, "Pattern Structure and Process in Steve Reich's *Piano Phase*," *The Musical Quarterly* 72, no. 4 (1986): 496, by permission of Oxford University Press.



Example 2.5. *Piano Phase*, analysis of section two.



Example 2.6. *Piano Phase,* analysis of section three.



On the other hand, a potential source of linearity throughout each phasing process is the relationship between downbeats. Each pattern of the piece emphasizes the downbeat by articulating it with the lowest note in the pattern, and in the case of the first pattern (which is in 6/8), both beats are emphasized. This emphasis by itself creates a strong sense of meter, and as the one piano remains unchanged through each process, it might be possible to hear the consistent meter. Still, meter by itself is not a cause of linear time, especially since it is not organized on any higher level in this piece. As Potter somewhat understates, the

interaction of the two separate downbeats creates a "complex metrical situation."[29] If there were no transition between stages of the phasing, the stability of one piano would keep the meter more strongly intact, but by creating ambiguity, the transition instead invites alternative hearings as there is a return to vertical listening after the linear tension.

Given the melodic and metrical strength of the lowest notes in the patterns, these notes do remain aurally present through each stage even if the true downbeat is obscured. The greatest points of tension between these opposing downbeats are the first and last stages of the phasing, where they are only a sixteenth note apart. As the downbeats gradually move away from one another, the tension is lessened until they regain complete stability at the midpoint of the process. In all three sections, the middle stage—numbers six, four, and two, respectively—has a clear articulation of the meter as the first half of the pattern is identical to the second. Furthermore, the consonance and dissonance of intervals is not relevant to the stability of these stages; in sections one and three, the middle stage is the most consonant stage in the process while in section two it is the most dissonant. Rather, it is the metrical consonance of the downbeats that creates a greater sense of stability at this middle stage. It is possible to hear the linear progression of each process through this conflict of downbeats, as the tension is introduced, slowly resolved, and then brought back to a height before the process returns to the unison. Still, as the repetitions and audible structure of the process are designed to induce vertical listening, this audible linearity acts more as a low-level signal to

[29] Potter, 186.

guide the listener through the process, simply weakening the overall verticality rather than abolishing it.[30]

The harmonic motion between each section is the only element of linearity to operate over the course of the entire piece. As Reich puts it, "The first [section] is twelve beats in B minor, the second eight beats forming an apparent E dominant cord, and the last is four beats in A (probably major but lacking a stated third scale degree)."[31] At first glance, this would create a strong ii - V^7 - I progression, but it is weakened by considerable "modal ambiguity."[32] Moreover, given that the second section does not begin until about midway through this twenty-minute piece and that there remains a strong sense of vertical time, it is extraordinarily difficult to hear any large-scale harmonic motion. If anything, these harmonic shifts simply emphasize the change in source material more than they alert the listener to any linear progression from one section to the next. The change of harmony is certainly perceptible, but it carries with it no forward momentum whatsoever.

Considering the interaction of linear and vertical time, it becomes clear that given the work's overall verticality, which was the intent of the composer, elements of linear time are most powerful when operating at the local level. While the relatively brief transitions between stages of the phasing process can create a strong sense of linearity, the arch form of

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[30] This linearity is in contrast with the consonance or dissonance of intervals at each stage of the process, which was unable to create linear time. The distinction is made because the ability of intervals to create tension and resolution is dependent on a framework, tonal or otherwise, that establishes them as such, which is does not occur in *Piano Phase*. The downbeat dissonance, however, is able to create linear time as the rhythmic framework is more fully established than the tonal.

[31] Reich, "Early Works (1965-68)," in *Writings*, 24.

[32] Potter, 187.

the phasing process is a source that is barely perceptible, and the large-scale harmonic change is almost irrelevant. Therefore, the overall sense of vertical time in *Piano Phase* limits linearity primarily to the local level, a principle that also holds true for Philip Glass's *Two Pages* and most all early minimalist compositions.

Philip Glass's Two Pages

Philip Glass's first exploration of minimalist processes began with rhythm. In November of 1968, Glass sketched out *1+1*, his first piece to employ additive process. Unlike phasing, which is more circular and predictable, additive processes gradually add or subtract notes from a basic musical unit. According to the instructions for the piece, two rhythmical units are to be combined "in continuous, regular arithmetic progressions."[33] The piece itself consists only of the two basic units (A and B) and the instructions for how they may be combined. Glass wrote out a few examples of how the process might work, such as AB, ABB, ABBB, ABB, AB, or ABBBBB, AABBBB, AAABBB, AAAABB, AAAAAB, but ultimately the construction of the piece was left to the performer.

The first fully realized work to use additive process, *Two Pages*, followed three months later. Scored for keyboard in one staff, the work limits melodic content to the opening five pitches (G-C-D-E^b-F), hereafter referred to as the basic unit, while the rhythm is invariant. The additive processes used in this piece, however, are much more complex than *1+1*, and allow for nested relationships. Wes York, in his analysis of the piece, identifies four processes that when used in various combinations lead to considerable complexity.

[33] Potter, 270.

These processes are: A) Subtraction of parts of a unit, B) Addition to parts of a unit, C) Repetition of an entire unit, and D) Repetition of part of a unit.[34]

As a byproduct of these arithmetic processes, meter is far from regular; the number of pulses per measure or figure varies from as few as five to as many as 262. Obviously, listeners would not hear 262 pulses, which would take over 45 seconds to perform,[35] as a single metrical unit but would rather subdivide them into smaller sections based on the particular repetitions of that unit. These constantly changing subdivisions effectively eliminate any feeling of consistent grouping above the pulse level. Without a larger grouping, any sense of meter simply returns the focus back to the process and its audible structure and does not itself have any forward momentum. Vertical time is established. Moreover, the score allows for indefinite repetitions of each stage of the processes, further adding to the sense of verticality.

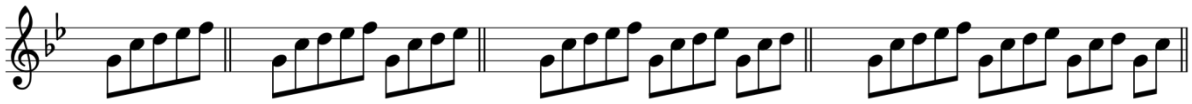
There are some instances where the various metrical subdivisions can be a source of tension and resolution and therefore interact with linear time. As with *Piano Phase*, throughout most of *Two Pages*, the lowest note, G, and its motion up a fourth up to C are articulated at the beginning of most subunits within a process. This motion becomes the focus in Part I especially, where notes are subtracted from the end of the basic unit (example 2.7). As the notes are subtracted, the subdivisions of the beat become shorter, so that the G is heard more frequently. As the frequency increases, the sense of stability also decreases, so

[34] In the original analysis, C and D were notated as α and β. Wes York, "Form and Process," in *Writings on Glass* (New York: Schirmer Books, 1997), 63-64.

[35] The given tempo indication is 168 bpm to the quarter note, with each eighth-note pulse lasting for 60/336 seconds. 262 pulses x 60/336 seconds/pulse = 46.79 seconds.

that the midpoint of this process, measure 4,[36] has the highest level of instability. This tension is then resolved as the process is reversed. Granted, the indefinite number of repetitions per measure weakens the sense of motion, but this aspect of linearity remains perceptible.

Example 2.7. Philip Glass, *Two Pages* (Dunvagen Music Publ., Inc., 1968), measures 1-4.

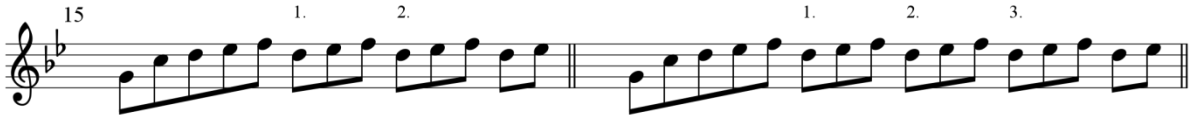


A case can also be made that the significance of the basic unit may also lend itself to instances of thematic tension and resolution. In Part II of the piece, where the last three notes of the opening pattern are subjected to process D, there are increasingly long absences of G. This absence may possibly be a source of tension, especially within the early stages of Part II, where the repetition of the note D stands in contrast to the stability of G (example 2.8). This tension then gets resolved as the number of repetitions of the D-E^{b}-F decreases from its peak of twenty. A similar situation arises in Part IV, where the G is omitted entirely. While the tension caused by a lack of this central note diminishes as the particular process becomes

[36] The measure numbers used will be based on the score published by Dunvagen Music Publ., Inc. These differ from both York's transcription and the sketches used in Potter's analysis. The published score does not write out every step in a process but instead skips to the end results of some. It therefore has only 31 measures. The five parts that York defines then have the following measure numbers in the published score: Part I, 1-7; Part II, 8-19; Part III, 20-24; Part IV, 25-28; Part V, 29-31.

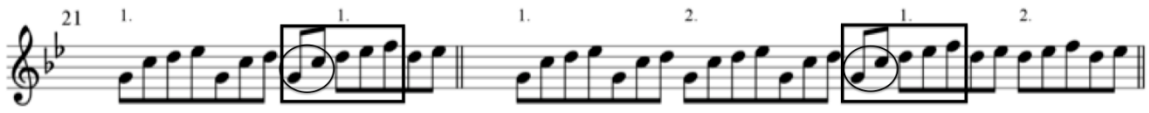
evident, this part seems to be lacking an anchor, and when the G returns in Part V, there is a sense of resolution and return.

Example 2.8. *Two Pages*, measures 15-16. © 1968 Dunvagen Music Publishers, Inc. Used by Permission.



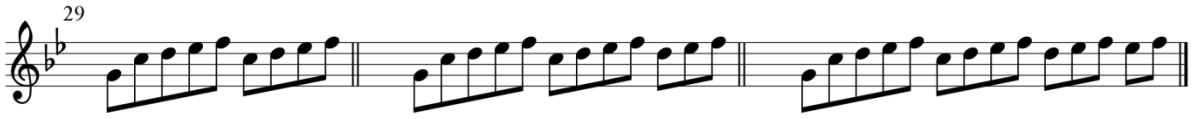
In Part III, the basic unit is essentially split into two halves, where the last note of the unit is omitted from the first half and the first two notes are omitted in the second. In a sense, the entire section sounds somewhat incomplete as these manipulations take place. Here again, repetitions can contribute to a sense of stability, but the basic unit remains aurally present as it is imbedded in the link between the two different parts. In example 2.9, the two-note link, G-C, completes the basic unit with the next three notes, even though they are part of the second half of this process. Were the basic unit not present, its absence would further contribute to the stability of this section, but its presence continues to illustrate the incompleteness of both halves of the process.

Example 2.9. *Two Pages*, measures 21-22. The circled notes are the two-note link while the box highlights the basic unit. © 1968 Dunvagen Music Publishers, Inc. Used by Permission.



Finally, Part V mirrors Part I in that notes are subtracted from the beginning of the basic unit instead of from the end (example 2.10). A major difference is that instead of having the process reverse itself and return to the basic unit, which may have brought a sense of conclusion to the piece as in *Piano Phase*, it simply ends with E^b and F. In this way, Glass avoids the stability of the basic unit, which had previously contributed to linear time. The result is that this ending, as Mertens writes, "gives the listener the feeling that he or she only hears a fragment in permanent musical continuum."[37]

Example 2.10. *Two Pages*, measures 29-31. © 1968 Dunvagen Music Publishers, Inc. Used by Permission.



The work's organization goes a step further than Reich's *Piano Phase* and seems to imply an overall, structured form. As York notes, "The work seems to articulate a tripartite form in which parts I and II function as exposition, part III as development, and parts IV and V as varied return. . . . This symmetrical ternary form is also reflected in the succession of arches which constitute the overall shape of each individual part."[38] With respect to time, it

[37] Mertens, 71.

[38] York, 66.

becomes important to determine whether the form itself is an agent of motion. And to make this distinction, it is necessary to understand how York reaches this conclusion.

Part of York's identification of a ternary form comes from the processes used. While all parts are subjected to C, the rest of the processes are presented rather symmetrically: I - A, II - B & D, III - A & D, IV - B & D reversed, and V - A inverted. This process symmetry is not necessarily reflected in the music material itself, however. Part IV omits the initial G, which had been an important marker for repetition through the first three parts, making it sound unique within the piece. Similarly, Part V is incomplete as a mirror to I. While the process is inverted, there is no return to the opening figure but rather movement toward an emphasis of the top note, F. Thus, despite the obvious construction of this piece, the form itself does not necessarily dictate any sort of forward motion for the listener.

The strongest case for vertical time comes directly from the repetition of units and the listening experience it creates. If each manipulation of the opening idea was repeated but a few times, the listener might focus on a linear unfolding of the process. Since each step is repeated multiple times, the listener is again free to explore the aural possibilities without expectation of the future or referencing of the past. Therefore, what has already been demonstrated through analysis is readily apparent after a single listening—that while localized instances of linearity are aurally present within some of sections, vertical time still dominates the overall listening experience.

Conclusions

The early process music of Riley, Reich, and Glass exhibits many qualities that create a primary sense of vertical time. While the processes varies considerably among composers,

their emphasis on limited pitch material, repetition, pulse, and audible structure help the listener focus entirely on the present, freely exploring the various possibilities and patterns that arise within their music. Still, this overall sense of verticality does not inherently exclude instances of linearity, particularly on the local level. A sense of tension and resolution is created in all three pieces that engages both memory and anticipation. Moreover, particularly with *Piano Phase* and *Two Pages*, linearity could also be heard as affecting entire passages or sections, though never to the extent where the verticality was overwhelmed. Therefore, while these early minimalist pieces create a strong sense of vertical time, even to a greater extent than many of the piano pieces that would follow their lead, instances of linear time remain present and still contribute to the overall listening experience.

CHAPTER 3

TOM JOHNSON'S *AN HOUR FOR PIANO*

Tom Johnson has said that he considers *An Hour for Piano* (1971) to be the first minimalist work that he composed,[1] though it had humbler origins than that historical position may imply. Johnson began sketching the work as a series of improvisations in 1967, when he worked as an accompanist for a modern dance class at New York University:

> I would sometimes write down a few measures of some particular kind of music I had found that seemed worth remembering. I had a drawer where I would keep these sketches. Many months after this started I went through the drawer and really liked seven . . . basic textures, so I took them home and started writing them out in detail, expanding them and composing transitions from one texture to another. All of them were comfortable at one tempo, so I could fit them all together. . . . I was still never thinking about what might come before and what might come after. These were just timeless textures.
>
> When I had quite a mess of isolated sections, I began connecting them, which often required writing a few additional pages. The pages and the sections began piling up, and it was clear that this might go on for a while, so as a way of setting a goal I came up with the title "An Hour for Piano." Gradually I linked all of these two-page and four-page and twelve-page sections together into one piece without interruption, but there was still no before and after. All the sections were just floating in the same time frame. The only reason the piece starts the way it does is that I never found anything that seemed to lead to that.[2]

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[1] In this interview he also cites the *Four Note Opera* (1972) as one of his first minimalist pieces. Dan Warburton, "Tom Johnson: Interview with Dan Warburton," Paris Transatlantic Magazine, March 2007, http://www.paristransatlantic.com/magazine/interviews/johnson.html (accessed 16 June 2010).

[2] Tom Johnson, "Re: An Hour for Piano," personal email, 16 June 2010.

Its improvisatory origins make *An Hour for Piano* distinct from the process-driven pieces analyzed in the previous chapter.[3] Rather than being highly regular, these textures, as Johnson calls them, appear in no particular order, are freely altered, and even combined with one another. Exact repetitions are also few, even though each texture is short, creating an ever-changing landscape for the listener. Moreover, elements of linearity are also present, from transitions that anticipate the arrival of a new section to the creation and resolution of melodic tension. Still, *An Hour for Piano* creates a strong sense of overall vertical time, perhaps even more decisively than many other minimalist works, not despite these characteristics but seemingly because of them as they help to keep the listener engaged for the entire hour.

Overview of An Hour for Piano

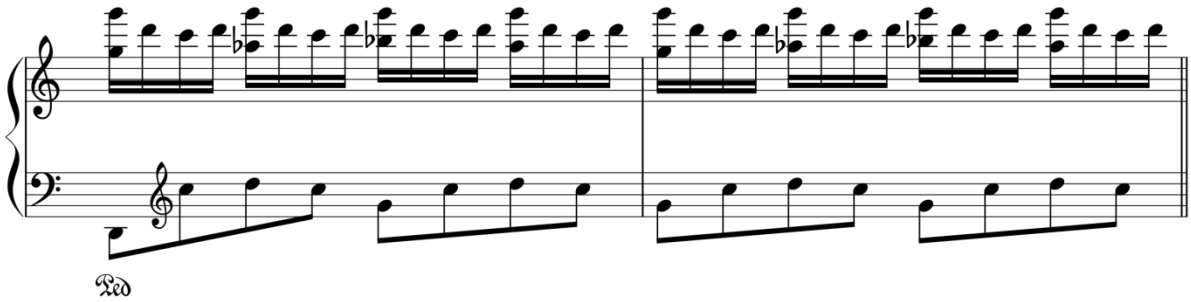
An Hour for Piano is based on six primary textures (Examples 3.1-3.6), hereafter referred to as themes,[4] as well as an additional transitional theme (Example 3.7) that appears frequently in loose combination with other themes. All musical material in the piece is

[3] It is also rather different from the music Johnson would go on to compose. Since around 1979, his compositions have tended to be far more rigorously process-oriented and/or mathematical. Pascal Decroupet, "Logic and Permutation in the Music of Tom Johnson," in *The Ratio Book: A Documentaiton of* The Ratio Symposium, *Royal Conservatory, The Hague, 14-16 December 1992*, ed. Clarence Barlow (Köln, Germany: Feedback Studio, 2001), 116. For example, his *Chord Catalog* (1986) for piano consists of all 8178 chords possible within one octave.

[4] Tom Johnson prefers the term "texture" in describing the piece so as to avoid referring to the specific melodic ideas. The basic melodic profile of each texture is important for establishing both its character and audible structure of the piece, and they remain easily distinguishable from one another despite their organic presentation. The use of the term texture also does not lend itself to the combinations, manipulations, and implications of these ideas that occur throughout the piece, which is why I prefer the term "theme."

derived from these themes, which are essentially one-measure ideas.[5] According to the score, the entire piece is played at a strict tempo of 59.225 beats per minute to the quarter note in order to achieve a performance that lasts for exactly one hour. Dynamics are to be "extremely subtle," ranging "between *mezzo forte* and *forte,*"[6] and while the meter is not notated, it does not often deviate from a common time feel.[7]

Example 3.1. Tom Johnson's *An Hour for Piano*, Theme 1, measures 1-3. Score excerpt printed with permission, Tom Johnson, Editions 75.

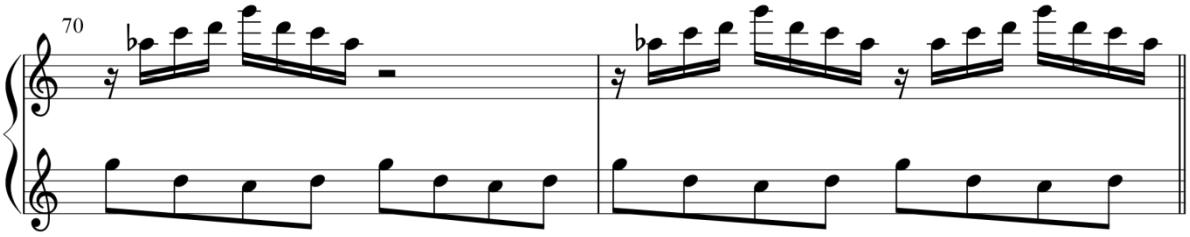


[5] Two- to four-measure examples were chosen to show both the essential character of the different themes as well as some of the different ways they are presented.

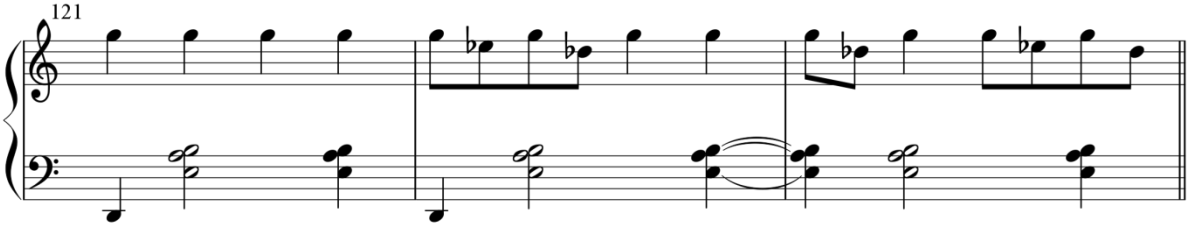
[6] Tom Johnson, *An Hour for Piano* (Paris: Editions 75, 1971), 1.

[7] Of the 870 total measures, only 61 (7.0%) are not in common time, and those measures vary from 2.5 to 7 beats in length. The total number of beats for the piece is 3553.5. This number is then divided by 60 to calculate the rather precise tempo indication.

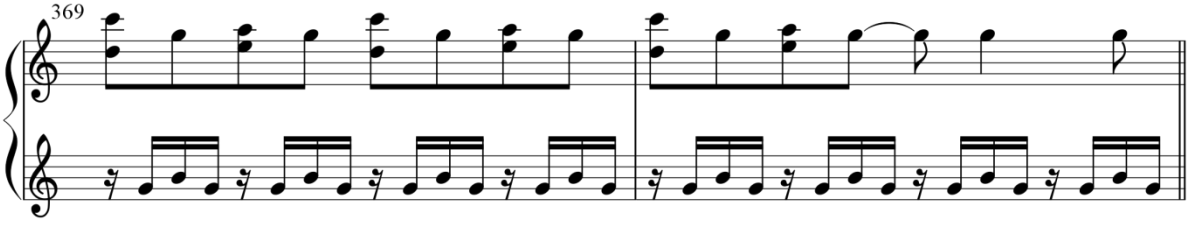
Example 3.2. *An Hour for Piano*, Theme 2, measures 70-71. Score excerpt printed with permission, Tom Johnson, Editions 75.



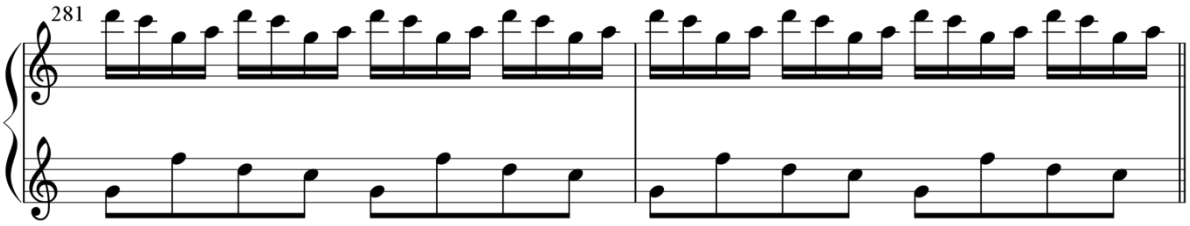
Example 3.3. *An Hour for Piano*, Theme 3, measures 121-123. Score excerpt printed with permission, Tom Johnson, Editions 75.



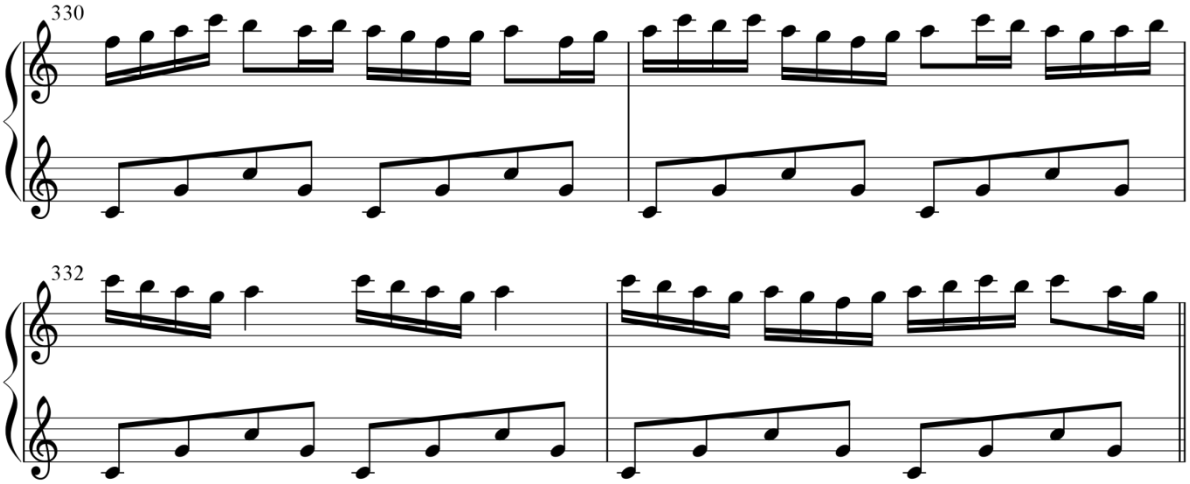
Example 3.4. *An Hour for Piano*, Theme 4, measures 369-371. Score excerpt printed with permission, Tom Johnson, Editions 75.



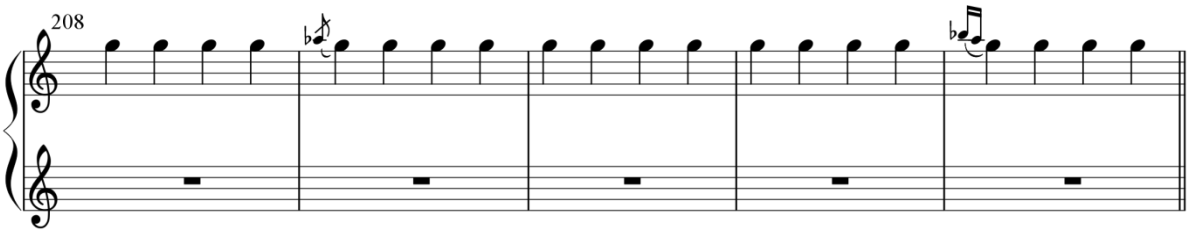
Example 3.5. *An Hour for Piano*, Theme 5, measures 281-282. Score excerpt printed with permission, Tom Johnson, Editions 75.



Example 3.6. *An Hour for Piano*, Theme 6, measures 330-333. Score excerpt printed with permission, Tom Johnson, Editions 75.



Example 3.7. *An Hour for Piano*, Transitional Theme, measures 208-212. Score excerpt printed with permission, Tom Johnson, Editions 75.



Rather than employing any specific compositional techniques to help this material span an hour, Tom Johnson composed with "intuition" to determine the placement of, variations within, and transitions between these themes.[8] The piece is divided into seventeen short thematic sections,[9] each employing only one of the primary themes. Toward the end of each of these thematic sections, the theme is broken down slowly until only a single note or pattern is left, while the next theme is likewise built up, making the beginnings and endings of thematic sections impossible to define with complete accuracy. The damper pedal also contributes to a blurring between thematic sections, as it is held down for the entire piece, and Johnson's transitional writing is designed to accommodate its effect.

Vertical Time

Johnson's organic compositional approach from early improvisations to intuitive arrangements does not inherently undermine the creation of vertical time, but does encourage a somewhat different listening experience than other minimalist piano works. In the pieces analyzed in chapter 2, much of the focus was on creating a considerable amount of listener freedom. The large number of exact repetitions gave the listener ample opportunity to explore the sounds as there are relatively long stretches of time where absolutely no new information is presented. The difference with repetitions in *An Hour for Piano* is that minute changes take place within a thematic section continuously and offer the listener something

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[8] Johnson, "Re: An Hour for Piano."

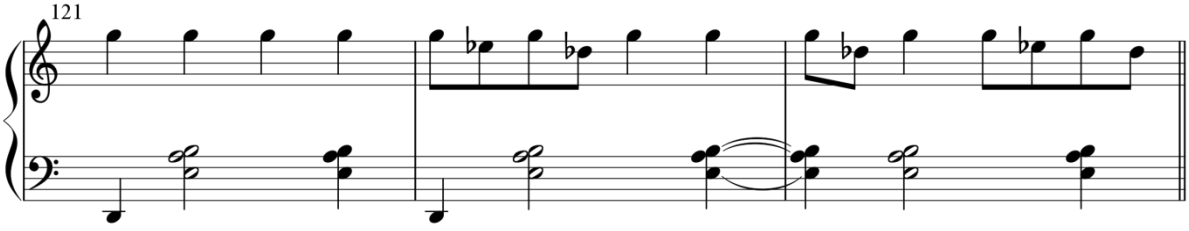
[9] A breakdown of these sections can be found in Appendix B. The term "thematic section" will be used to designate musical passages based on only one of the primary themes, of which there are 17. This is in contrast to the three large sections that comprise the form of the work, which will be discussed later in this chapter.

new, while changing the underlying material. Repetition remains at the forefront of the listening experience and acts to create vertical time, but the listener is more engaged with the music as it unfolds. This does not mean the listener is so drawn to the immediacy of the pitches that exploration of particular notes, intervals, or overtones is not possible, but rather that it is not explicitly necessary. In pieces where there are many exact repetitions, such exploration is not only necessary but also the intended focal point; in *An Hour for Piano* it is only one possibility.

Consider for example the third theme as presented in example 3.3. This theme could be expressed as only measure 122—the quarter-note pulse on G in the right hand, the adding of E^b and D^b to the texture in eighths, the low D in the left hand on downbeats, and the left hand chord presented on the second and fourth beats of each measure. This basic material is invariant from measure 121 to 136 and lasts for one minute, eight seconds.[10] However, the pattern is never exact. The low D may be present on successive downbeats, or may have as many as two measures between iterations. There are also usually no more than two lone quarter notes in the right hand before the addition of either E^b, D^b, or later C^b. But there is no pattern to how frequently or in what order those eighth notes are included. The listener is constantly presented with slightly different information even though the music never significantly changes, limiting freedom while still creating a strong sense of vertical time.

[10] 16 measures times 4 beats/measure times the duration of each beat, which is just over one second (60/59.225 seconds/beat).

Example 3.3 (reprinted). *An Hour for Piano*, Theme 3, measures 121-123. Score excerpt printed with permission, Tom Johnson, Editions 75.



Another contributor of vertical time, a strong sense of pulse, is also present in this piece. Here again, Johnson does not seek to create metrical ambiguities, encouraging listener freedom, but rather reinforces the sense of common time with the content of each theme.[11] There is rarely any organization above the metrical level into either phrases or hypermetric groupings, and the sense of pulse remains steady throughout. Notice that each theme, with the exception of the sixth, emphasizes G at either the quarter-note or half-note level, while the sixth theme has a clear middle-C pulse on the first and third beats of each measure. This emphasis of pulse acts like the ticking of a clock and even undermines to a small extent the organization at the metrical level.

Finally, while the structure of the piece is not as predictable as in process-driven compositions, it still lies on the surface and is completely audible.[12] The themes each have a

[11] The only theme that does not always emphasize the meter is the transitional theme on the repeated quarter-note G. Even there, the grace notes and occasional blending with other themes usually provide a downbeat emphasis when present.

[12] This is not the same level of audibility as the process-driven music already discussed, but is related to Johnson's own concept of audible structure. For Johnson, audible structure relies on the situation where "the pitches, rhythms, and colors presented in the first few minutes usually define a specific kind of music, and the remainder of the piece will not depart very far from that." Tom Johnson, "La Monte Young, Steve Reich, Terry Riley,

distinct profile that makes them easy to recognize, so while Johnson varies them within their respective thematic sections, dismantles or builds them up in transitions, and occasionally combines them with one another, everything remains readily apparent to the listener. Clarity of texture is also important to Johnson as there is a distinct separation between melodic and accompanimental material, both in terms of rhythm and register. The subtle manipulations that may occur are easy to hear, and the combinations of themes are likewise apparent as they tend to take the melodic content of one theme and combine it with the accompaniment of another, avoiding any sense of density or complexity.

Audible structure is also maintained by Johnson reserving extremely gradual changes for the transitions—each thematic section essentially presents only one idea. These transitions tend to be drawn out as Johnson mirrors the slowly fading sounds of the previous theme, sustained with the ever-held damper pedal, by having the musical elements slowly reduced. Not surprisingly, the length of transitions is often over a minute, with one of the longest transitions, centered on measures 632-662 (example 3.8), well over two minutes.[13]

As with the thematic sections of the piece, this transition has no sense of regularity or exact repetition. The accompaniment of the fourth theme is reduced to a descending third, occurring sporadically, while the melodic material merges with the transitional theme. The right hand does not seem to make a complete transition as the harmonic perfect fourth of E to

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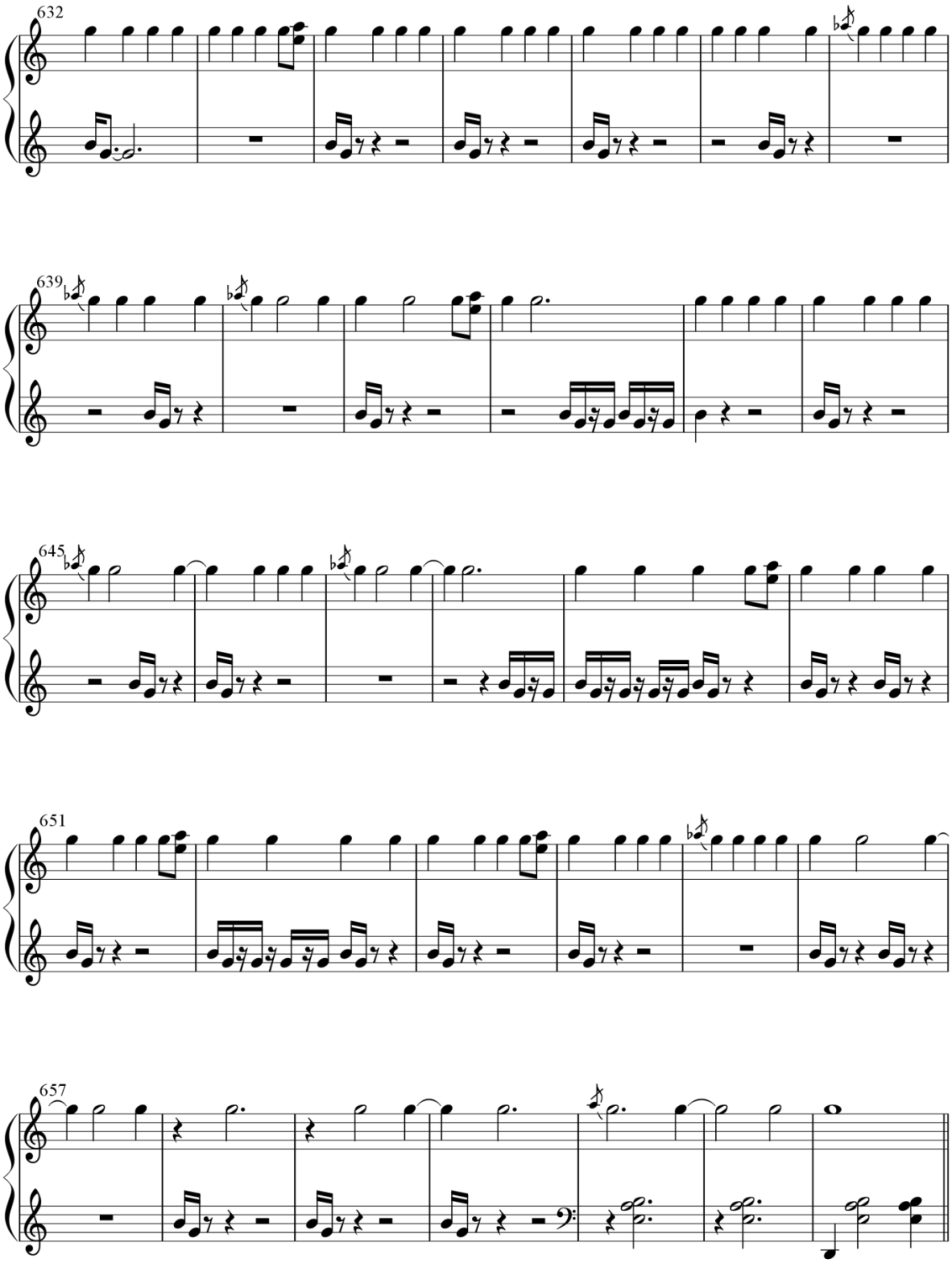
Philip Glass" in *The Voice of New Music* (Eindhoven: Apollohuis, 1989), [PDF version online] http://www.editions75.com/Books/TheVoiceOfNewMusic
.PDF (accessed 19 May 2010): 29.

[13] The case for an even longer transition could also be made as the fourth theme starts breaking down as early as measure 620 and the right-hand eighth notes of the third theme do not appear until measure 671. Again, these transitions make defining specific beginnings and endings of thematic sections difficult.

A of the fourth theme appears as late as measure 653. This combination is maintained until the third theme's left-hand chord is brought in at measure 660; the right hand only later takes on characteristics of the third theme. Most transitions in the piece tend to function in this manner, and there are even a few deceptive transitions within thematic sections where a theme is broken down only to be built back up and continue. The effect of these transitions is not propulsion forward into a new idea, but rather a suspension of time due to the slow rate of change and the frequent inclusion of the transitional theme and its static qualities.

Example 3.8. *An Hour for Piano*, transitional passage, measures 632-663. Score excerpt printed with permission, Tom Johnson, Editions 75.

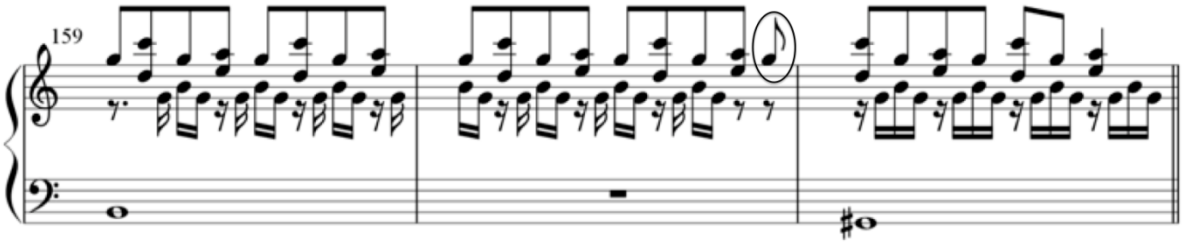


While these transitional passages contribute to the audibility of the structure, they can also present mysteries of the work more easily than do the thematic sections, allowing for a greater amount of listener freedom. One of the ways Johnson achieves this freedom is through altering of the lengths of measures, both to create ambiguity and to accommodate differences between themes. For example, the second sounding of the transitional theme is a combination of half notes and quarter notes, with the measures far from regular in length. Indeed, measures 85-94 have the following beats per measure: 6, 4, 7, 5, 7, 7, 4, 3, 7, and 6. As grace notes always fall on the notated downbeats, the listener must either consider certain notes as syncopated or make the necessary adjustments to the heard meter. This ambiguity naturally creates different possible hearings of the passage, allowing for some degree of listener freedom while also cleansing the palate before the next thematic section.

Such ambiguities are also sometimes a necessity, particularly in relation to the fourth theme. The transitional theme and second theme each have as their basis a repeated treble G in quarter notes. The fourth theme maintains this basis, but instead of being on the beat, the position of the repeated note is shifted by an eighth note. Transitions between these thematic sections typically have passages where the repeated G is displaced, albeit rather subtly. Consider example 3.9, which is taken from the first thematic section to be based on theme four (example 3.4). As the theme is first presented in this example and the preceding ten measures, the G is on the beat. However, with the additional eighth note in measure 160, which changes only the placement of the bass note and not the pattern itself, the downbeat shifts and the G is now on the offbeats. This new downbeat is then reinforced by more frequent instances of a low bass note, though it may take a few measures for the listener to

make the adjustment. This potential ambiguity is exploited in almost every instance of this theme, allowing the listener to interpret these passages with different metrical implications.

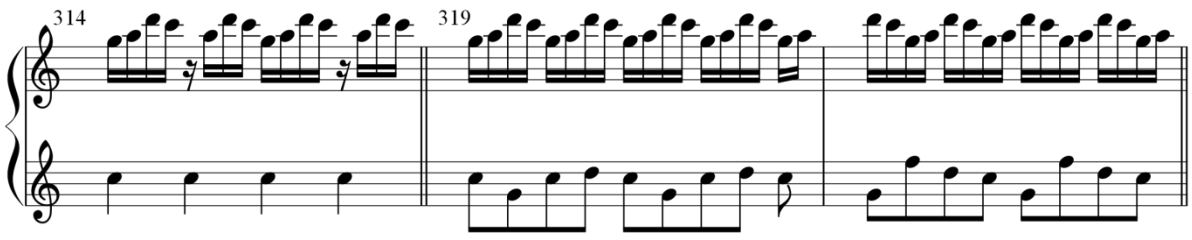
Example 3.9. *An Hour for Piano*, fourth theme, measures 159-161. Score excerpt printed with permission, Tom Johnson, Editions 75.



Johnson sometimes uses this same technique with other themes, such as in example 3.10. Before this excerpt, a quasi-transitional passage, beginning around measure 299, broke down elements of the fifth theme. Rather than moving into a new thematic section, the theme returns again to its normal form in measure 320. During this "transition," the right hand melodic material returns in measure 314 an eighth-note off from its original metrical position. The level of ambiguity then increases as the accompaniment, which had been steady quarter notes, moves into a new eighth-note pattern. What is notable about this figure is that it is derived from the accompaniment of the first theme and is likewise displaced by one eighth note. This motion helps destabilize the downbeat, even though there has been no obvious aural disruption to the meter. The full return of the theme to its original form comes

after Johnson adds a single eighth note to measure 319, creating a seamless transition.[14] By slowly adding to the metrical ambiguity, Johnson is able to guide the listener back to the fifth theme with incredible subtlety, which in turn promotes a vertical listening experience.

Example 3.10. *An Hour for Piano*, fifth theme, measures 314, 319-320. Score excerpt printed with permission, Tom Johnson, Editions 75.



While there are other examples where Johnson seems to encourage different hearings of particular thematic sections, the listening experience is still strongly tied to the continuous alterations of themes and the transitions between them. This by itself discourages a free exploration of the piece by the listener as the music seems to do this on its own—the focus remains on the present because of subtle variations rather than because of more explicit stasis. While the verticality of the piece is largely created by the strong sense of pulse; continuous, if varied repetition; extremely gradual changes; and clear sense of structure; most of the vertical listening that takes places tends to be written out in the score rather than being derived by the listener. This in turn makes the piece more accessible to audiences as there is

[14] Notice also that the last two eighth notes of that measure are identical to the second and fourth beats of the normal form of the theme, as seen in measure 320.

always something new to listen to, even if the underlying material is constant, helping them to remain engaged with the piece for the entire hour.

Melodic Sources of Linear Time

As part of his intuitive compositional process, Tom Johnson also opened up the possibility for significant interaction with linear time. While Johnson retained the overall verticality, he did allow events to take place that at times surprise, create tension and resolution, alter the pacing of the piece, and even create a sense of overarching form. Not unexpectedly, the effect of this interaction between linear and vertical time varies considerably, from becoming almost entirely linear on a local level to altering subtly the sense of vertical time on the macro level. In some ways, this interaction is not wholly unlike the pieces analyzed in Chapter 2, inasmuch as linear time was considerably less prominent at larger hierarchical levels. However, *An Hour for Piano* differs in that these linear elements are even more prominent, given that they are not byproducts of a specific compositional process but are deliberately included.

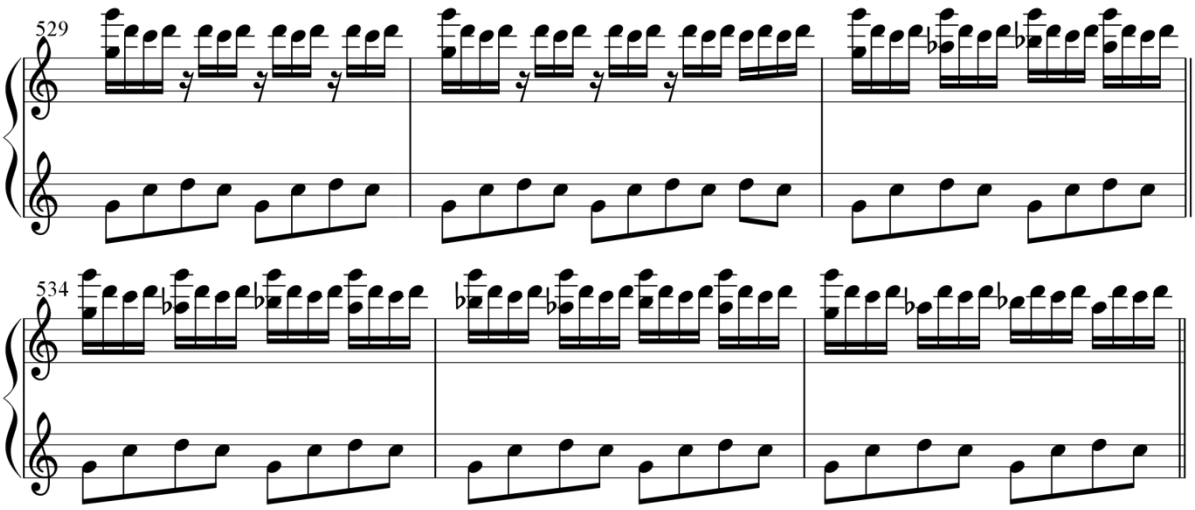
Melodically, the first and second themes naturally carry with them the potential for more linearity than the others since the end of each one-measure and two-beat unit, respectively, has an unresolved A^b. That is, the basic unit of each of these themes spirals into its next iteration. In most cases, this sense of propulsion is negated by repetition, but there are some instances where this characteristic is exploited to create a sense of tension and resolution. For instance, the first theme, which opens the piece, is not heard again for over

33 minutes.[15] Its arrival is therefore aurally distinct, and Johnson adds to the effect by creating linear time on the local level.

Example 3.11 marks the return of the first theme and there are several different ways Johnson creates tension in these six measures. First, his use of the octave Gs in measure 529, which do not proceed to the expected A^b and B^b, creates a sense of anticipation with the listener. The same thing happens again in the following measure, but the tension is even further heightened by an additional beat, delaying the downbeat and complete return even further. There is also an omission of a sixteenth-note rest at the start of beat five in this measure, further propelling the listener to the downbeat of measure 531. Just a few measures later, Johnson creates another source of tension by a different alteration to the theme. In measure 535, the octave Gs that are expected to fall on the downbeat are replaced instead by a M6 with a B^b as the lower note. This unexpected substitution creates melodic tension as the line from preceding measure presents G-A^b-B^b-A^b-B^b-A^b-B^b-A^b before finally resolving to G on the downbeat of measure 536. Granted, there are many alterations to this theme as it is presented each time, most of which carry little to no linear implications, but the long absence since it was last heard, combined with the pronounced tension of these changes here creates localized linear time.

[15] The first theme ends around 3:06 and does not return until 36:13. (All timings have been calculated based on a metronomically consistent performance, as per Johnson's performance indications.) This is the longest amount of time between complete instances of a particular theme in the entire piece. The next longest is in the third theme, from the end of its second instance, 18:24 until its return at 45:34, a length of 27:10. Yet even this theme returns at least partially in transitional material during that span. The long absence of the first theme, then, is substantial, especially considering the aural importance it receives by starting the piece.

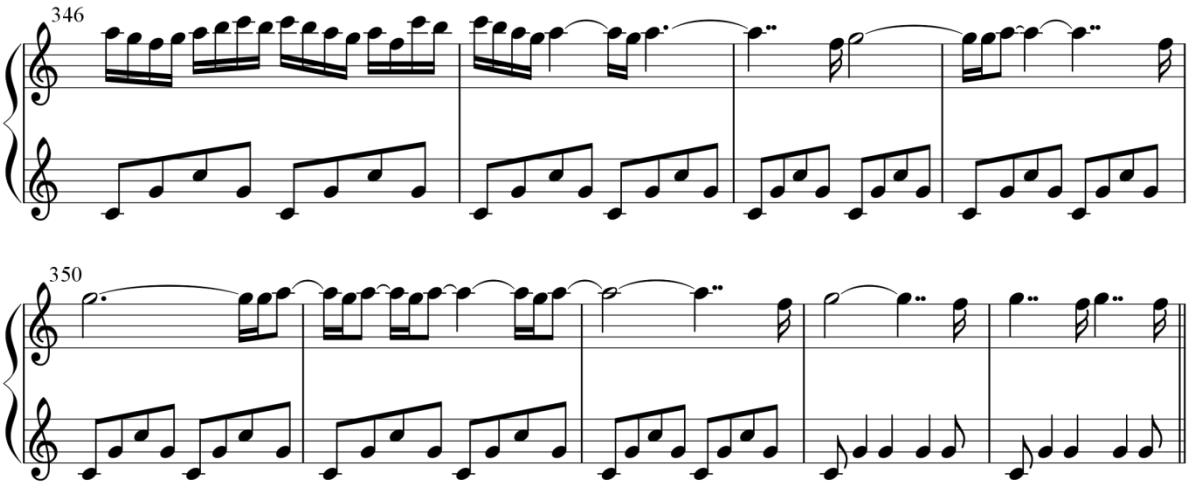
Example 3.11. *An Hour for Piano*, first theme, measures 529-531, 534-536. Score excerpt printed with permission, Tom Johnson, Editions 75.



Even more remarkable instances of linear time are created by the sixth theme. By itself, the sixth theme does not have the same forward momentum as the first or second theme. Instead, the sixteenth notes in the right hand tend to wander among the white notes between F and C while the left hand maintains its steady, eighth-note accompaniment. The potential for linearity comes as notes of longer durations in the right hand tend to be on A, creating of dissonance over the C-G accompaniment. In most cases, the note is short and the meandering continues, but there are instances where the A is deliberately emphasized before it resolves to G. Example 3.12 is taken from the end of the first statement of the sixth theme. Here the tension of A, which had been weakened earlier by elements of verticality, is brought to the forefront through longer note values before it resolves to G in measure 348. To further emphasize the dissonance of A and resolution to G, Johnson repeats this motion as if it were a cadential extension. From the pickup to measure 351 until measure 353, there are four

repetitions of A of increasing duration, until the thematic section is brought to a close in measure 353. From here, the stability of G is used to transition into the third theme.

Example 3.12. *An Hour for Piano*, sixth theme, measures 346-354. Score excerpt printed with permission, Tom Johnson, Editions 75.



While there is a strong sense of linear motion through this tension and resolution, the sense of closure provided by the G is even more significant because of its structural position in the work. This passage marks the close of this particular thematic section, but it also marks the end of any new themes as well. The sixth theme is the last to be introduced, and from this point on, Johnson returns to earlier themes with gradually more significant alterations. As such, this strong sense of stability and resolution is used as a structural marker for the entire work. This resolution also has harmonic implications for the piece, which ties into the overall form as well. The pitch G is certainly the anchor for every theme, to the extent that Kyle Gann wrote that this piece "never deviates from the key of G, though

some dissonant motives wash through from time to time."[16] However, Johnson chose to have this passage, the strongest cadential moment in the entire work, end with an implied C chord in the bass. This movement has enormous ramifications in terms of harmony and structure, as understanding G as dominant rather than tonic allows for a more cohesive and elegant understanding of the composition.

Harmonic Basis of the Primary Themes

Throughout *An Hour for Piano*, Johnson keeps harmonies ambiguous by avoiding any overt thirds within chords. This avoidance helps to give the piece its somewhat aimless quality, contributing to vertical time and highlighting the centrality of the pitch G given its repetitions. The pitch content and profile of the themes detract from hearing G as tonic, and instead increasingly point to a tonic of C. This is not to say that this focus on the dominant builds tension until the resolution seen in the last example, but rather that the themes avoid being anchored by the actual tonic, contributing to vertical time. The linear implications of a C tonic are primarily formal, giving the piece an overall structure that is not wholly imperceptible to the listener.

Before considering a form based on C as tonic, the case must be made for this possibility within the individual themes as seen in examples 3.1-3.6. Within the first theme, there is only one element that implies a C tonic, which is the A^b in the right hand, and even it may be interpreted in different ways. Remember that the melodic content of this theme is centered on the G-A^b-B^b-A^b motion, which without repetitions creates a strong drive to G.

[16] Kyle Gann, "Sixty Minutes to Change Your Life," PostClassic, entry posted 23 April 2004, http://www.artsjournal.com/postclassic/2004/04/sixty_minutes_to_change_your_l.html (accessed 25 June 2010).

Yet while the A^b does strengthen the role of G that does not inherently imply that G is the tonic. To be interpreted as such, it would have to be in Phrygian mode, but this modality is never established through other harmonies of even a distinct movement away from G. As a consequence, the possibility of G here acting as a large-scale dominant remains a possibility.

The same situation arises in the second theme with the inclusion of A^b in the arpeggio-like figuration. But unlike the first theme, the left hand contributes to a feeling of C as tonic. Notice that the left-hand accompaniment is an inversion of the accompaniment for the first theme. Therefore, instead of outlining the fifth from G up to D, it outlines the fifth from G down to C, though still with the aurally important, perfect fourth leap from G down to D. This is a slight difference from the first theme, but an important one as the aural strength of G as tonic continues to weaken as each new theme is introduced.

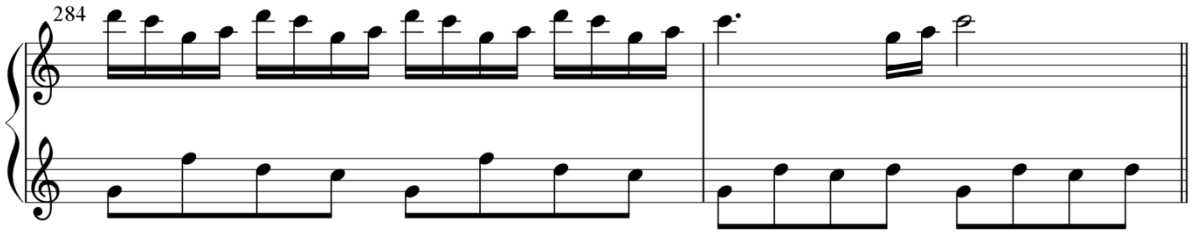
The third theme presents a great deal of ambiguity concerning its harmonic basis. The pitch G continues to be important in the right hand, but now it is combined with E^b, D^b, and C^b, which have not yet been seen. Moreover, the accompanying chords are dissonant against these pitches, consisting of a low D followed by the E-A-B chords, and there are no C-naturals in either hand as might be expected if C were tonic. The complete collection of pitches, then, is G, A, B/C^b, D^b, D, E^b, E, which by itself seems to defy categorization.[17] If the hands are separated from one another, two observations can be made. First, the left hand seems to be working with one quintal harmony—D, A, E, B—and the right hand functions in whole-tone scale. Thus both hands deny any pitch as being central, which leads to another

[17] Some pitches would have to be considered dissonant and thus omitted to have this theme fit within a recognizable scale, but the material does not seem to give any such indication.

observation concerning the structural placement of this theme: the third theme sometimes acts as a bridge between themes whose pitches fall into C minor and one whose pitches fall into C major, and is the only primary theme to be combined with other themes as outlined in Appendix B. Therefore, the tonal ambiguity of this theme is exploited within the overall form and can be seen as a further weakening of G as a potential tonic. The remaining themes focus more attention to C and in particular C major.

The fourth theme does seem to emphasize the importance of G both with the frequency of the note in the right hand and the G to B third in the left. On the other hand, the melodic content of this theme, derived from the top notes, emphasizes C, with its frequent placement on the downbeats, and G as its dominant, a perfect fourth beneath. Granted, the C is always heard as part of a minor seventh with the D below, yet this is an example of Johnson weakening linear implications rather than recreating the ambiguity of the third theme. The fifth theme is the first to exploit more fully the dominant function of G. Here, the accompaniment has a prominent minor seventh from G to F, and while it omits the third of the chord it can still be understood as a V^7 in C major. To further emphasize the importance of C, there are a few deviations from the basic form that resolve melodically to that pitch, which can be seen in example 3.13.

Example 3.13. *An Hour for Piano*, fifth theme, measures 284-285. Score excerpt printed with permission, Tom Johnson, Editions 75.



In a sense, the sixth theme, with its accompaniment figure centered on C, can be seen as a resolution of this harmony, though the movement between these two themes is so gradual that the repetition within each all but eliminates any sense of linear harmonic motion. What is significant about the sixth theme is that it is the only one clearly to have C as its tonic or even to establish firmly any tonic, for that matter. This clear tonic gives greater credence to the possibility of interpreting the other five primary themes in this way. It is important to note, however, that there is no sense of linear time created by this harmonic construct. There is no great build up of tension where the listener anxiously awaits the resolution of the first five themes. There is no sense of dominant function until the fifth theme, and even then it is weakened to the point of irrelevance as it takes nearly three minutes to "resolve" to the sixth. The effect of emphasizing the importance of G while at the same time implying a tonic of C is therefore twofold: the themes seems to float aimlessly, without an anchor, contributing to vertical time, and it provides a loose form for the piece, which only slightly alters the overall sense of vertical time.

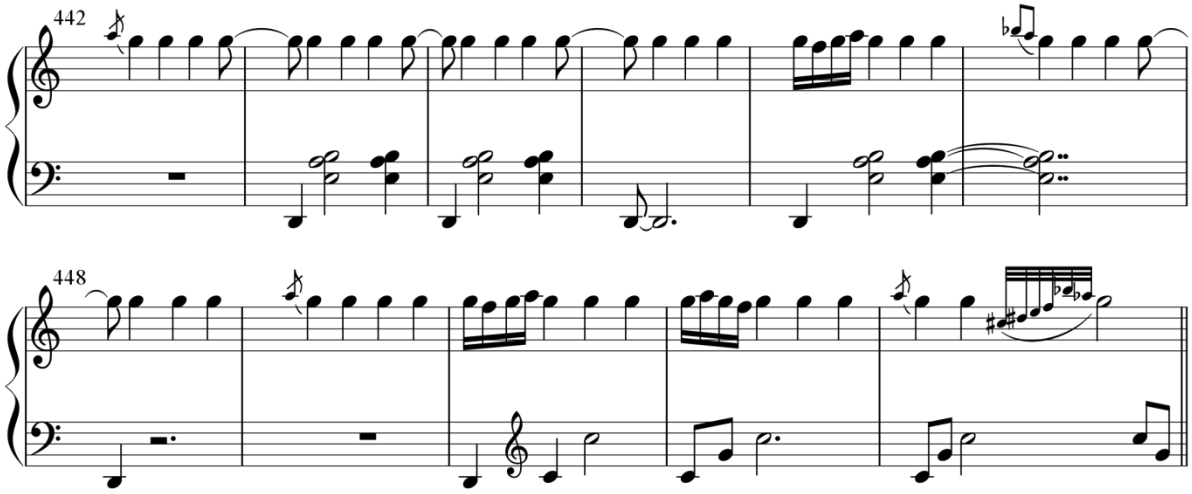
Form and Linear Time

Despite Johnson's intuitive process of composition, an imbedded from exists in *An Hour for Piano*. The structure of the piece is roughly divided into three sections, which are based on the order and nature of the themes presented. The first section ends with the conclusion of the first presentation of the sixth theme and is not quite twenty-five minutes long. No new themes are introduced beyond this point, making a case for this section as a quasi-exposition, with the aural marker for the closing of this section being the cadence heard in example 3.12. This strong resolution not only ends this particular theme, but also, given the understanding of the themes in relation to C, marks an overall progression from the opening to this point. Of course, this cadence merges seamlessly with the transition into the next theme, diminishing the sense of closure. What is most noticeable, aside from the introduction of all musical material being complete, are the changes that take place in the next section.

The second section of this work (measures 355-723) is more tumultuous than the first, which did not deviate too far from the basic forms of each theme, and it too lasts for nearly twenty-five minutes. Within this section, the alteration of themes becomes greater, transitions tend to be more dissonant, and the lengths of measures are also more variable. For instance, a transitional passage between themes two and six (example 3.14) is highly disruptive and does not follow the same smooth blending of themes that was common in the first section. Here the repeated G motive is displaced from the beat by measures with 3.5 and 4.5 beats, and while the accompaniment of the third theme is included, the right hand keeps the transitional theme steady while also adding sixteenth notes from the sixth theme.

Moreover, the movement into the next theme is quite dissonant. The left hand has a sustained low D as it moves into the expected accompaniment in measure 450, and the right hand has a large group of grace notes in measure 452, which is the only time this particular figure is presented with anything other than the transitional theme by itself.

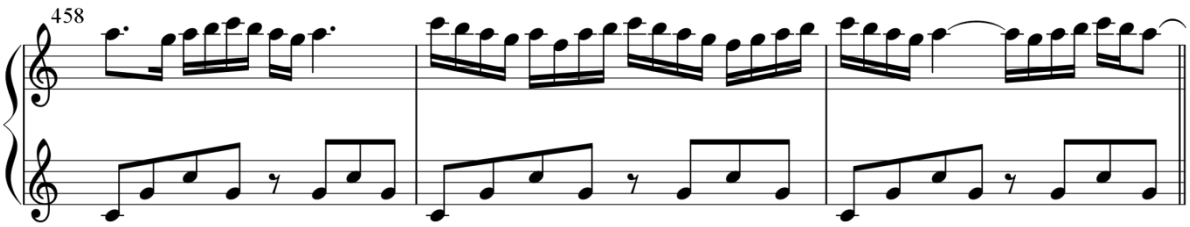
Example 3.14. *An Hour for Piano,* transitional section, measures 442-452. Score excerpt printed with permission, Tom Johnson, Editions 75.



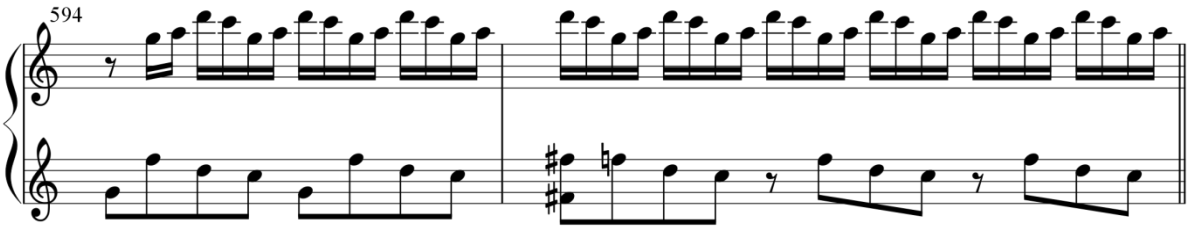
The alteration of the themes themselves is also more significant. Not long after this transitional passage, the sixth theme, which previously had a flowing, even texture, takes on more of a halting quality through the use of rests, particularly in the accompaniment. While the material does not appear to be too different in example 3.15, it is important to realize that the accompaniment figures were never subjected to alteration in the first section, save in transitional passages. The rests here give this theme a rather different aural quality; to not have any note present on the third beat of measure 460 can be jarring to the listener given the

already established feeling of near perpetual motion. Johnson uses this addition of rests with the second and fourth themes frequently in this section, and further disrupts the continuinty of the piece by including octave F#'s and D#'s at unexpected times. These notes were previously only heard as an alteration of the fourth theme, but in this section they are freely incorporated elsewhere, creating both surprise and dissonance, as can be seen in the left hand of example 3.16, measure 595.

Example 3.15. *An Hour for Piano*, sixth theme, measures 458-460. Score excerpt printed with permission, Tom Johnson, Editions 75.



Example 3.16. *An Hour for Piano*, fifth theme, measures 594-595. Score excerpt printed with permission, Tom Johnson, Editions 75.



The middle section is also less organized than the first as there is no sense of thematic progression. Instead of the major and minor themes being mostly separated, they alternate

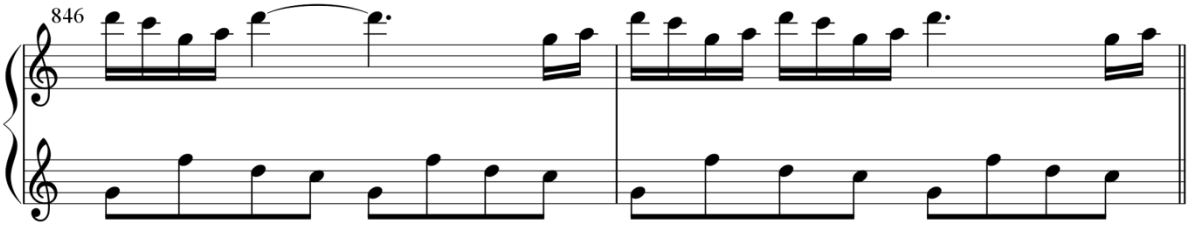
back and forth and even combine in transitional sections, creating strong dissonances. The only event that seems to have any formal importance is the first theme's return, which was long absent from the piece. However, the aural significance of this return is but a red herring and does not signify any structural strange. Its treatment in example 3.11 is by far the most regular within this particular appearance. Shortly after that excerpt, there are many disruptions, including several five-beat measures, the omission of the octave, and a lack of alignment between the melodic material and its accompaniment. In short, while its return initially seems important to the listener, especially given its strong sense of linear, melodic motion, it quickly blends into the section by matching the instability of the other themes.

Interestingly, the next and final instance of the first theme does mark the beginning of the final section at measure 723. This concluding section does not continue the same level alteration of the middle section but rather returns to most of the norms established in the first, both in terms of stability and order of themes. The presentations are notably shorter than in the first section, which was 14:31 longer, but the impression is still that of a return to the opening, creating a sort of A B A' form. What might be expected is for Johnson to bring this section to a convincing conclusion, as he did with the first. Instead, he leaves the listener without a clear end to the work by presenting the fifth theme last instead of the sixth, and by diminishing any sense of conclusion that the sixth theme originally had.

There is actually a similar build up to a cadence with the sixth theme (measures 821-824) to what was seen in example 12, as if the piece were drawing to a conclusion. The sustained A does not resolve to G, however, as material from the sixth theme is introduced with the pickup to measure 825, so while a G does appear in the right hand seven measures

later, its role as resolution has already been all but eliminated as the listener hears it more in the context of the next theme. Then, by ending with the sixth theme, which in the first section had acted as a large-scale V^7 harmony, there is absolutely no sense of resolution or conclusion. As if to reinforce this effect, Johnson even introduces a sustained D in the right hand of this theme, which seems to want to resolve down a step to the tonic of C (example 3.17). This motion gives the theme an even stronger sense of needing to resolve, but here again the expectation is thwarted. The piece seems to simply end, as if the ending were more dictated by the hour being finished than the musical material itself.

Example 3.17. *An Hour for Piano*, fifth theme, measures 846-847. Score excerpt printed with permission, Tom Johnson, Editions 75.



While there is a formal structure to *An Hour for Piano*, it does not significantly alter the sense of vertical time. The three major sections bear a slight resemblance to an exposition, development, and recapitulation, but do not motivate the piece through time. There is a sense of closure to the first section, but there is also no conflict or problem established. The change to a more unstable section may be noticeable, but the musical material again does not necessitate the change. Perhaps if the final section had a similar

conclusion to the first, the sense of form could have a more substantial impact on the verticality of the piece. As it is, however, these large sections seem to be but subtle guideposts through the work, helping to keep the piece from being completely directionless but not significantly affecting the overall verticality of the piece.

Protracted Duration, Temporal Compression, and Synchronicity

An Hour for Piano creates a sense of temporality that is different from most early minimalist pieces. Repetition, pulse, and audible structure all act to create vertical time, yet at the same time the constantly changing surface does not inherently create the same level of listener freedom. Likewise, the sense of linearity is present on multiple hierarchical levels as Johnson freely includes minimalist musical elements with his organic compositional approach. Yet the most significant distinction between this piece and those discussed in Chapter 2 is the manner in which *An Hour for Piano* interacts with clock time.

Kramer defines clock time as "absolute time as measurable by a clock;"[18] it is not the experience of time but the objective time as Western society has most commonly come to accept it. In music, clock time does not often factor into the music itself. An audience may wish to know the approximate duration of a composition beforehand, but ordinarily the composer does not usually intend for that knowledge to affect directly the perception of the music. This is not the case with *An Hour for Piano*. Even while the title does not necessarily inform the listener that the performance should be *exactly* one hour, he or she understands that it should at least be approximately so. This understanding in turn can lead to a greater sense of conflict between protracted duration and temporal compression.

[18] Jonathan Kramer, *The Time of Music* (New York: Schirmer Books, 1988), 452.

As was stated in Chapter 1, these two experiences of time are an integral part of minimalist music: While the sense of time slowing is felt in the present, time usually seems to have passed quickly when the listener compares the perceived duration of the past with the elapsed time according to the clock. By including the clock-time length of the piece in the title, Johnson seems to encourage the listener to check the clock at least occasionally. This feeling in turn makes the listener much more aware of the disparity between these temporal experiences than in most minimalist music, or taken to an extreme can potentially eliminate the sense of compressed temporality.

One of the surest ways to slow time, particularly when waiting for something or someone, is to constantly check the clock. "The more signals for the passing of [clock] time we notice, the longer we judge a period of time to be."[19] A listener who becomes overly preoccupied with the elapsed clock-time of the piece can lose the sense of musical time and essentially replace it with the protracted duration of waiting and boredom.[20] Yet, even a listener that remains focused on the music may still have the same experience. Johnson embeds a signal for clock time in *An Hour for Piano* with the strong sense of quarter-note pulse. This pulse, which is but 1.3% slower than an actual second, is strongly felt throughout the piece, and in many cases, such as with the transitional theme (example 3.7), is clearly heard with the repetition of a single pitch. This pulse, when combined with the known duration of the piece and sense of vertical time, can cause the sensation of compressed

[19] Stefan Klein, *The Secret Pulse of Time*, trans. Shelly Frisch (New York: Marlowe and Co., 2006), 126.

[20] This problem is not the exclusive domain of this piece or even minimalism, but can be felt more acutely given the nature of the piece and its title.

temporality to be replaced by protracted duration—time seems to pass slowly both in the present and upon reflection.

To help the listener avoid this pitfall, Johnson has included lengthy program notes that are "to be read while hearing."[21] He wrote the notes in 1974, three years after he completed the piece, and described them as being "strictly an afterthought, almost independent from the music."[22] Yet they can be an important part of the listening experience. The notes are self-explanatory and mirror the minimalist aesthetic of the piece with repetition and slight variation. The notes, as they state often, are "intended to increase your ability to concentrate on the music," and as such also encourage the reader to "not read further" if this goal is not achieved.[23] They also contain prompts for the listener, asking him or her to consider the pacing of their reading in relation to the music, the affect of reading the same passage at different times with different music, and even how the text impacts the work's perceived form. Given the freedom the reader has concerning pacing, pauses, and even whether or not to read the notes, these can certainly help the listener focus more intently on the music and avoid the danger of clock watching.

At the same time, Johnson seems to be interested in creating the experience of synchronicity during the piece as well. Synchronicity is where "the perceived passage of

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[21] Tom Johnson, *An Hour for Piano* (Paris: Editions 75, 1971), i. The program notes are reprinted in their entirety in Appendix C.

[22] Tom Johnson, "Re: An Hour for Piano" (June 17, 2010).

[23] Johnson, *An Hour for Piano*, i.

time is nearly synchronized with the standard temporal units of clocks and calendars."[24] This is not the normal experience with minimalist music, as has already been shown, but the program notes encourage the reader to consider the remaining time of the piece in relation to the remainder of the text.

> You may also want to consider the length of the piece. The program notes are also rather long, but if you read them at a normal pace you will finish them long before you finish hearing the music. But if you read slowly, or if you stop from time to time, you may finish reading them about the same time the music finishes. . . .
>
> Now that you are approaching the end of the program notes, you may want to consider the length of the piece. You should be able to estimate roughly how long it will take you to finish reading the program notes at the present rate, and about how much music will be left after you finish reading them.[25]

The effect of the program notes is threefold: they help to avoid the perils of clock watching by providing another source of stimuli, increase concentration on the music through its free structure and prompts, and encourage perception of all three types of temporal experiences—protracted duration, temporal compression, and synchronicity. Such wide-ranging interactions with time clearly distinguish this piece from other minimalist compositions as it not only seeks to create a rich sense of musical time but also incorporates clock time as well.

Conclusions

An Hour for Piano represents a different approach to minimalist piano writing than was seen in Chapter 2. The intuitive construction of the work creates a strong sense of vertical time even if the level of listener freedom or exploration does not seem to be the

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[24] Michael Flaherty, *A Wathced Pot: How We Experience Time* (New York: New York University Press, 1999), 98.

[25] Johnson, "Album Notes."

same. With this compositional approach, Tom Johnson in some ways explicitly writes out what other composers would have required listeners to explore individually, but at the same time repetitions, pulse, and audible structure remain fundamentally intact, creating vertical time. Moreover, this sense of vertical time and its interactions with linear time help to keep the listener engaged with the piece for the entire hour. These linear implications are largely limited to local-level, melodic motion.

While there does exist a large-scale form with some harmonic implications of its own, this combination acts more to create a hybrid time construct where the sense of vertical time is only slightly altered; since it is unlikely that one would be able to hear the sectional nature of the work, the implications of the form are weakened considerably. In the end, this form likewise helps to focus the attention on the piece, but without most of the sense of recollection or anticipation. Therefore, while elements of linear time are clearly a part of the listening experience at various hierarchical levels, they do not negate the dominant verticality but instead enhance it by means of interactions between the two.

The addition of clock time to the listening experience further enhances this interaction of vertical and linear time, a characteristic that makes *An Hour for Piano* distinctive from its counterparts. Through the apt title, constant pulse approximating the ticking of a clock, and inventive program notes, Tom Johnson gives clock time a vital role in the piece. It is not included at the expense of protracted duration and temporal compression, but rather added alongside these temporal constructs. Understanding the rich and unique temporal experience of *An Hour for Piano* can only be fully understood only through its interaction with and

creation of time, and any analytical approach that fails to address the issue of time therefore remains incomplete.

CHAPTER 4

LINEAR AND VERTICAL TIME IN POSTMINIMALISM

Minimalist piano compositions tend to create a strong sense of vertical time whether the compositional approach is process-driven, intuitive, or improvisatory. However, as we have seen, this overall sense of vertical time is not mutually exclusive with linear elements, particularly on the local level. Even at larger hierarchical levels there are some aspects of linearity, though these levels tend to be more deeply imbedded and of less significance. It is this mixture between the two that creates the listening experience in most minimalist music, as purely vertical music tends to be the exception rather than the rule.

In the second half of the 1970s, composers began to incorporate much more freely aspects of linearity. In the case of some of the early minimalists, this shift was more subtle and gradual.[1] Younger composers quickly began blending ideas from minimalism with a variety of other materials. These so-called "postminimalists," despite shared aesthetics and compositional techniques, tended to create distinctly different listening experiences in their pieces compared to their minimalist counterparts. The aspects of vertical time creation—repetition, pulse, and audible structure—were not as strong in their compositions, and linear elements tended to be more common and powerful. At the same time, however, their sense

[1] This is most notable in the music of Reich and Glass. Tom Johnson remains one of the few composers to compose in that genre as well as self-identify as a minimalist.

of linearity is far from teleological; these pieces often possess a sort of unrealized forward motion. Thus, as was the case with minimalism, it is the interaction between linear and vertical time that shapes the experience of postminimalist pieces. To understand this interaction in a postminimalist context, it is necessary to see how these more prominent elements of linearity are affected by those of verticality,[2] beginning with the foundation of linear time.

Rhythm and Meter

The establishment of meter is important for projection through linear time, and rhythm is one of the strongest ways establish meter. As David Epstein writes, "Time and motion, in music as everywhere else, have two basic aspects: structure and process. . . . Meter and rhythm fulfill a structural role, serving as undergirding, or support, for motion. Thus they regulate motion, controlling the degree of its forward thrust."[3] Whereas Glass minimized most metrical implications in *Two Pages*, which helped encourage vertical listening, William Duckworth makes his processes far less obvious and projects them in linear time through the interaction of rhythm and meter in his *Time Curve Preludes, IX* (1978-79).

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[2] This analytical approach parallels that which is found in chapters 2 and 3. While it was assumed that minimalist pieces tend to create an overall sense of vertical time, postminimalist pieces exhibit a sense of linear time, albeit usually quite weakly.

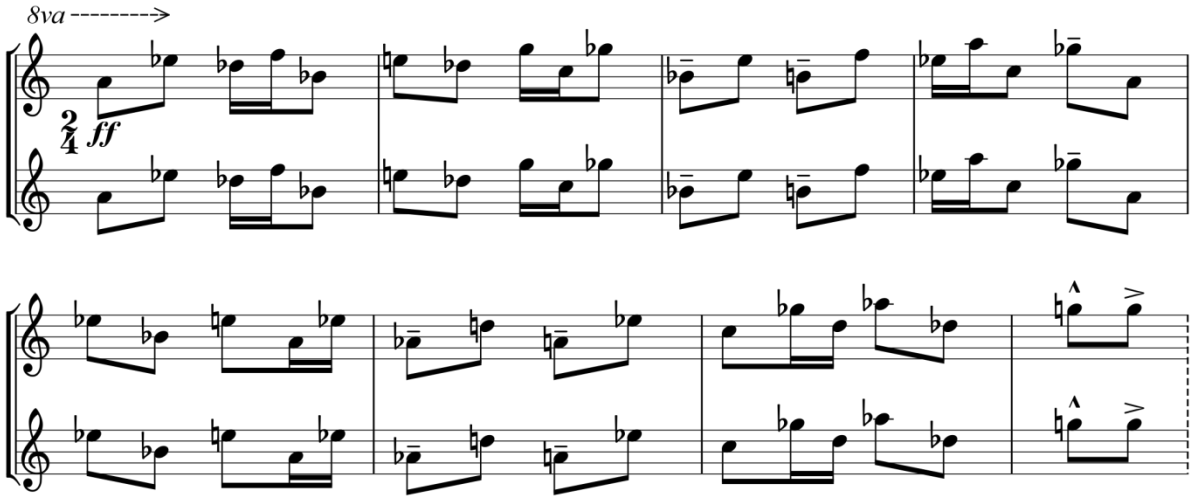
[3] David Epstein, *Shaping Time* (New York: Schirmer Books, 1995), 11. It should be noted that Epstein uses the word process in a different context from the process music of early minimalism. Here process concerns more the pacing of motion rather than the support/regulation of motion, and its role is fulfilled by tempo.

The ninth prelude is one of the most structured and process-driven pieces in the *TCP*, yet it still maintains a sense of linearity. The prelude uses two subtractive processes in combination with two themes and a rhythmic ground.[4] The piece opens with the 35-note first theme in octaves (example 4.1). The theme is presented 17 times, but upon each repetition, Duckworth drops the theme's first note. To add a layer of complexity, he presents this theme over a rhythmic ground that lasts for 8 measures, so that the theme has a constantly shifting rhythmic profile.[5] To clarify each instance of the theme, Duckworth ends with repeated Gs, the only repeated notes in the piece. These are also always accented eighth notes to help further emphasize them aurally.

[4] The pitch content is based entirely on Satie's *Vexations*. Walter Frank, "The Piano Music of William Duckworth," (M.A. thesis, Wesleyan University, 2005), 37.

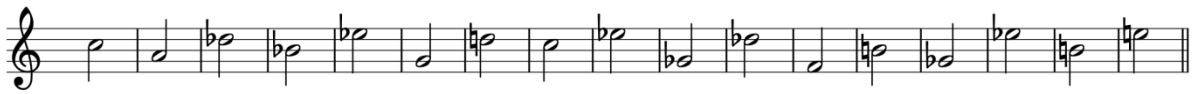
[5] The exception to the rhythmic ground concerns the two repeated Gs at the end of the first theme. The measure(s) these two Gs fall into always have the same rhythm of four consecutive eighth notes. Thus the rhythmic ground in its purest form is found in mm. 17-24. For further analysis of this ground see Appendix D.

Example 4.1. William Duckworth's *Time Curve Preludes, IX*, First Theme, measures 1-8. (New York: C. F. Peters, 1979), 55. Copyright © 1979 by Henmar Press Inc. Used by permission of C. F. Peters Corp. All rights reserved.

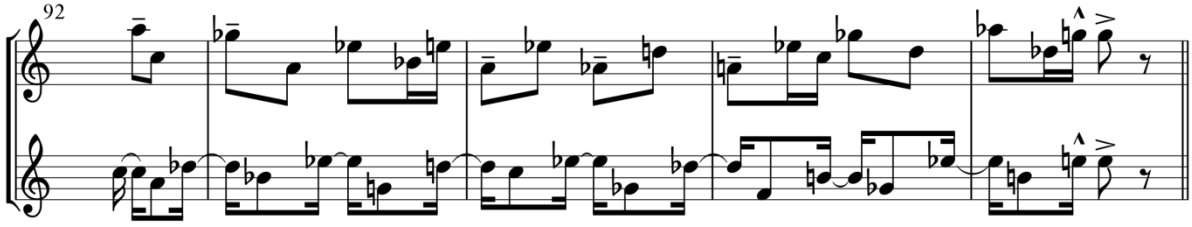


Moreoever, Duckworth adds a second theme in measure 18, which consists of 17 half notes (example 4.2), while the right hand continues the already established process. Upon each repetition of this second theme, the note values are decreased by the duration of a sixteenth note, which over the course of seven iterations reduces their values to eighth notes. The eighth-note version of the theme is then repeated to conclude simultaneously with the sixteenth iteration of the first theme (example 4.3), after which both hands present the final repetition of the first theme in octaves as was done in the beginning.

Example 4.2. *Time Curve Preludes, IX*, left-hand theme, measures 18-34. Copyright © 1979 by Henmar Press Inc. Used by permission of C. F. Peters Corp. All rights reserved.



Example 4.3. *Time Curve Preludes IX*, measures 92-96. The first notes of measure 92 are omitted to clearly show the beginning of each theme. The right hand is 8^{va} for the entire piece. Copyright © 1979 by Henmar Press Inc. Used by permission of C. F. Peters Corp. All rights reserved.



Certainly this piece is process-oriented to the extent that meter seems but a secondary consideration. Still, both meter and rhythm play a significant role not only in the processes but also in projecting this piece in linear time. At the work's outset, it is already clear to the listener from the rhythm of the first two measures that there are two levels of duple subdivision—the eighth note and sixteenth note. The third measure reinforces the meter by presenting only eighth notes and adding a *tenuto* to each beat. By this point, the meter and is established and will continue unless there is substantial information to the contrary, creating a framework through which linear time might be established.[6] Even the subtractive process used on the first theme has no effect on metrical pulse. Since the first theme is presented with a rhythmic ground, it is heard as shifting in relation to the meter rather than shifting the meter itself.

Duckworth further reinforces the meter when the left hand begins the second theme in half-notes—for the first third of the piece there is no metrical ambiguity. When the second

[6] Kramer notes that meter has a "tendency to continue, even when confronted with syncopations or empty pulses, until definitely contradicted." *The Time of Music* (New York: Schirmer Books, 1988), 82.

theme begins to undergo its subtractive rhythmic process, it is still too weak in comparison to the first theme to bring metrical change. The rhythmic activity of the right hand, which continuously reinforces the meter, is more aurally prominent than the still slower moving left hand.[7] Moreover, Duckworth does not articulate the end of a repetition of the less-prominent second theme, so the only aural marker for this process is the increase of activity within each measure. Despite the nature of this rhythmic process, it does not alter the perception of the meter and therefore does not interrupt linear flow.

With meter firmly established through the piece, it becomes clear how rhythm drives the piece forward through time. After the theme has been fully presented, there begins to be a gradual increase of activity due to the subtractive processes. Not only do the number of notes per measure increase on account of the second theme, but the repeated Gs of the right hand also appear more and more frequently. The end result is a feeling of gradual *accelerando* to an unknown conclusion. If Duckworth had let these processes run until the first theme terminated, it might be possible to say that meter would have dissolved in a flurry of activity. Since he brought back the opening, there is an effect of closure—the return to the *fortissimo* and clarification of texture is dramatic and seems appropriate as the destination of this gradual increase of intensity. The establishment of meter and treatment of rhythm in this piece create a sense of linear time.

It would appear that the piece is devoid of elements of verticality. The themes do not move the piece forward through time either melodically or harmonically; the work is entirely dictated by process. Any sense of repetitions is inexact, and the listener hardly has the

[7] The subordinate nature of the second theme is also reinforced by the inherent inability of the piano to do anything but decrescendo on held notes.

opportunity for freely exploring the music as it is constantly changing. Moreover, there are two processes running simultaneously that do not coincide with one another, undermining verticality by not allowing the structure to be entirely audible. As these vertical elements are inadequately established, they are unable to override effectively the sense of acceleration and progression with the listener. However, these markers of vertical time remain important given the almost complete lack of additional linear elements. With more repetitions, the effect of this thematic and rhythmic contraction might have been similar to Part I of *Two Pages,*[8] but since it becomes the focus of the entire prelude, the experience seems to be linear, even though the process is essentially static.

Melodic Implications

In minimalist piano music, melody lost most of its meaning as a contributor to linear motion as composers deliberately avoided writing melodies that were too active and diminished any temporal implications through repetition. By returning to an emphasis on melodic writing, postminimalist composers were able to regain some of its potential for creating linear time. Yet their approach also represents a blending of minimalism and common practice techniques, such that motion is incorporated but also never fully realized. For example, the second movement of Peter Garland's *Jornada Del Muerto*, "Ring of Bone," (1987) has little musical material, with only five chords in the right hand and three notes in the left. "No process or continuity device informs this music; it is entirely and intuitively melodic in conception, if chordal in execution. Yet despite its extreme paucity of material,

[8] See Chapter 2, pgs. 47-48.

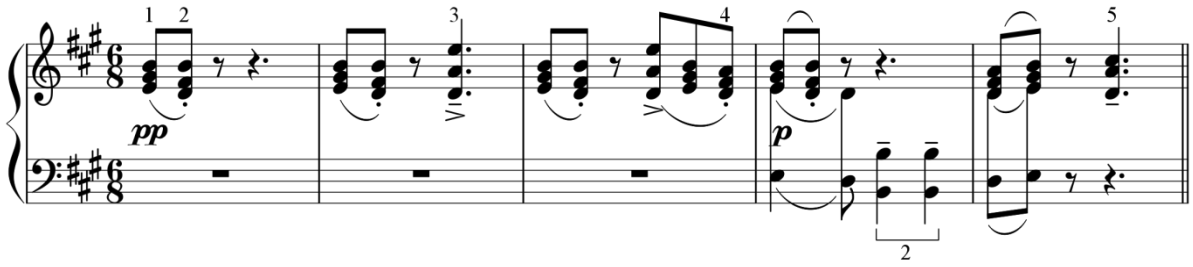
this . . . movement goes through seven sections touching on four different textures and rhythmic styles, undulating between two tempos."[9]

The movement is written in E Mixolydian, and the melodic ideas are derived from the top notes of five different chords, which in turn only produce four potential melody notes—A, B, C# and E. The unifying motive is a repetition of B over I and v chords followed by a rest (example 4.4, measure 1). This motive immediately presents some interesting ambiguities, for while it is the fifth scale degree, all the motives center on B, making it the destination of melodic motion.[10] Also, since it is presented as being both part of I and v, it fulfills another dual role as part of the tonic and the minor dominant chord. To create melodic motion away from B, Garland often uses it as a passing tone between C# and A, which creates an expectation of a return to B, activating the past and future in the listening experience.

[9] Kyle Gann, "Postminimalism: Chapter One, Metaphorically Speaking," PostClassic, entry posted 28 May 2007, http://www.artsjournal.com/postclassic/2007/05/postminimalism_chapter_one_met.html, (accessed 8 July 2010).

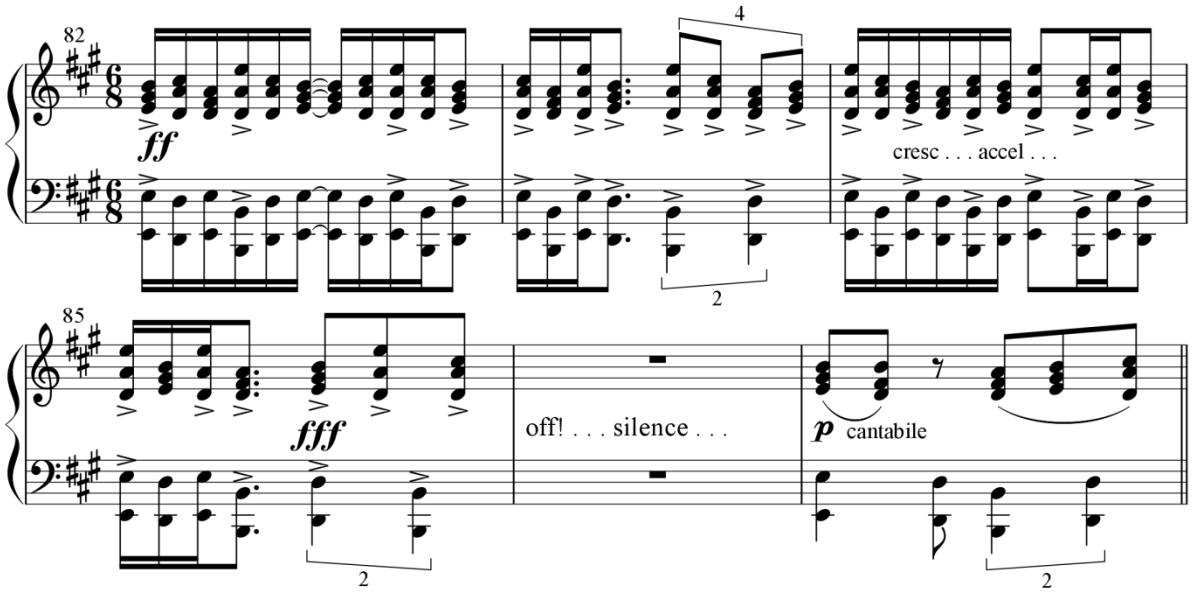
[10] This is not unlike *An Hour for Piano*, where all the themes centered on G, while the tonic remained C.

Example 4.4. Peter Garland's *Jornada Del Muerto,* "Ring of Bone," (Lebanon, NH: Petroglyph Music, 1987), measures 1-5. The five right hand chords are numbered. Score excerpt printed with permission, Peter Garland, Petroglyph Music.



Perhaps even more remarkable is the strong pull of this simple opening motive exerts. Even when B is the focus of a different melodic idea, there remains an expectation of the return of this particular motive as it is prominent in almost every section of the piece. For example, the greatest sense of anticipation comes toward the end of the piece as the penultimate section fails to include this motive (example 4.5). This omission, combined with the gradual *crescendo*, creates tension as the listener expects its return in the last section of the movement, demonstrating how even a simple motive can be a powerful agent for creating linear time.

Example 4.5. "Ring of Bone," transition into the final section, measures 82-87. Score excerpt printed with permission, Peter Garland, Petroglyph Music.



The seven different sections of "Ring of Bone" are clearly audible to the listener, but ultimately the differences between them depend on tempo, rhythm, and dynamics far more than the notes themselves.[11] In limiting himself to these five chords in the right hand, which never change octave or inversion, Garland exhausted the potential melodic implications. Still, it is only this lack of varied material that skews the listening experience more towards vertical time. There is no real repetition in this movement, and the varied rhythms interact with and activate the meter as opposed to only the pulse. The result is that while this limited melodic material has an almost aimless quality, such as the sixth theme in *An Hour for*

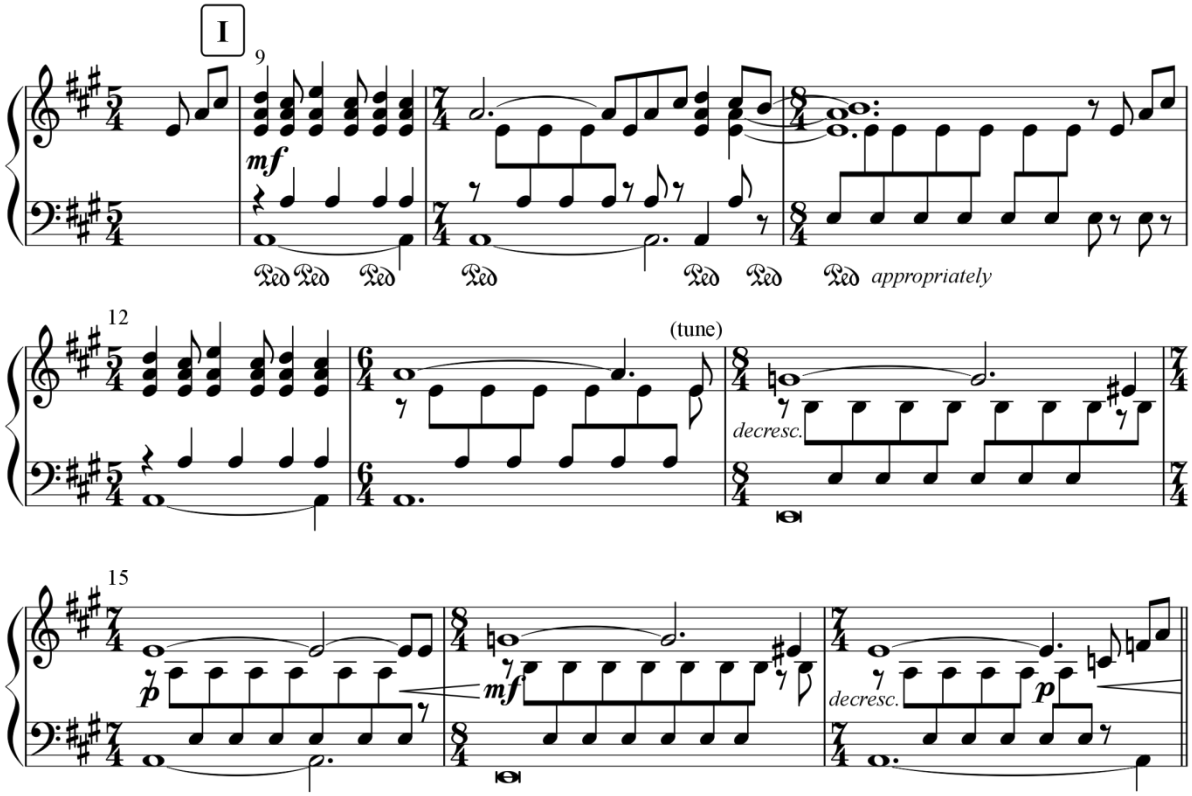
[11] The only possible exception is the fourth section, which begins in measure 49. Here, both hands deviate from their chords and octaves in favor of single notes. Still, even these notes do not deviate from the basic figures introduced in the first five measures.

Piano, it is still employed to activate linear time through movement away from and to B and to articulate large-scale sections.

Just a melodic motion tends to be limited in postminimalist music, so too does thematic development, even in a set of theme and variations such as Beth Anderson's *Net Work* (1984). By keeping the theme clearly audible and relatively unchanged, and by severely limiting the amount of variation that takes place, Anderson creates the effect of a minimalist aesthetic through the repetitions of the form. Yet the subtle changes to the melody allow it to preserve its sense of motion despite the audible structure and repetitions.

The theme for this piece (example 4.6) is constructed in two parallel phrases, which in itself indicates motion through time as was demonstrated in Chapter 1 with Mozart's Sonata in A Major, K331 (example 1.1). The first phrase has motion from $\hat{4}$ to $\hat{2}$ (m. 10), supporting the half cadence in measure 11 and preparing a resolution to $\hat{1}$ in the second phrase. This second phrase does not resolve this expectation as the melody proceeds from $^{\flat}\hat{7}$, through an enharmonic $^{\flat}\hat{6}$, to $\hat{5}$ and also to an authentic cadence. Anderson omits the third of the chord, possibly implying a modal mixture with this cadence, and this omission creates an ambiguity that is not completely resolved until the final variation. By resolving this compositional problem at the end, Anderson is projecting each variation forward to this final cadence.

Example 4.6. Beth Anderson's *Net Work* (Self published, 1984). Theme, measures 9-17. Score excerpt printed with permission, Beth Anderson.

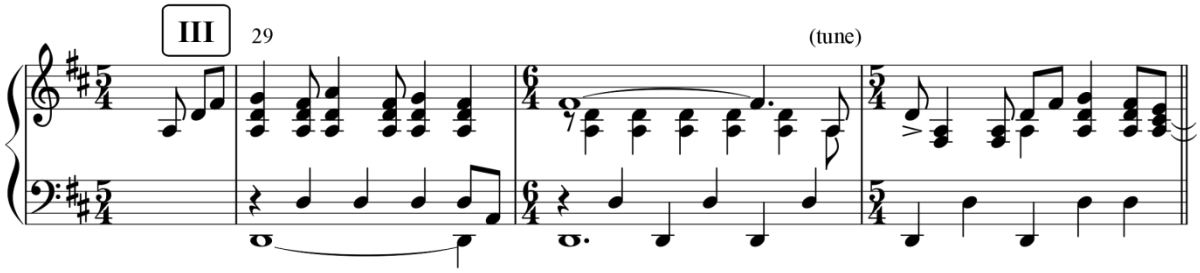


The twelve variations do little to alter this basic outline of the melody and instead tend to be more stylistic changes in terms of accompaniment and rhythm, particularly in the first seven variations.[12] Because of this approach, the instances of melodic alteration become prominent as the listener expects Anderson to fulfill the simple, but strong melodic motion. In the second variation (example 4.7), the expected return to tonic via a skip from $\hat{3}$ in

[12] The remaining five variations after the seventh do go a little beyond this basic structure, such as in the eighth "fantasy variation," and the tenth "collage variation." The fantasy variation is much longer than the others, as it first presents the theme and then moves into more improvisatory writing, while the collage variation is actually a mixture of every variation that had preceded it, both in terms of style and even key.

measure 30 is avoided, creating a halting sensation, a tension which is partially resolved on the downbeat of measure 31, though ultimately weakened by the eighth-note pickup. It is not until the parallel portion of the second phrase behaves as expected that this tension is fully resolved, creating a strong sense of movement through time.

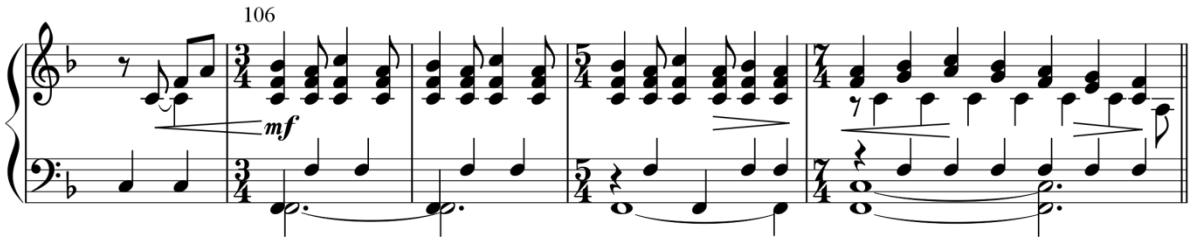
Example 4.7. *Net Work*, Second Variation, measures 29-30. Score excerpt printed with permission, Beth Anderson.



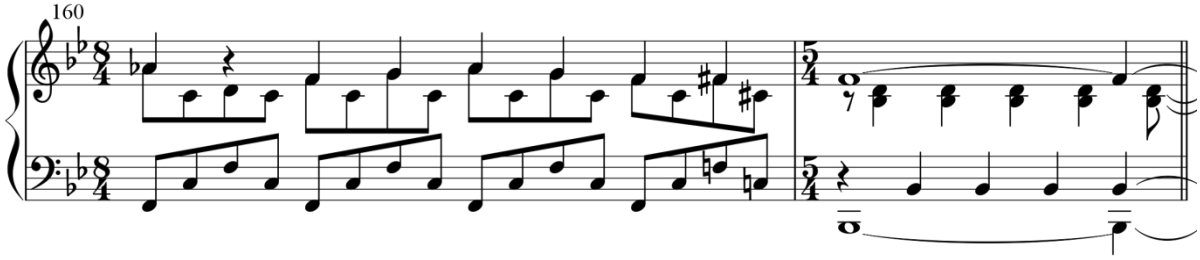
There is a similar delay of expectations in the seventh variation as the first four notes after the upbeat arpeggio are repeated three times, creating six beats where previously there had only been two. Moreover, these six beats hover around the unstable fourth scale degree, which on its own has a strong pull to $\hat{3}$. This delay happens again in the following phrase (example 4.8), but instead of a brief return to tonic before going to the modal cadence, Anderson creates a new stepwise line that uses its downward momentum to push through tonic to the cadential figure. This momentum in the eighth variation sets up the fantasy variation, which after presenting the opening of the theme eschews the expected modal cadence for an extended improvisatory section. Thus, the alteration of the theme in the seventh variation allows for greater freedom in the eighth, and moreover, the eighth variation

uses the stepwise line of the seventh within the cadence to create a sense of resolution to the figure that had previously been a source of tension (example 4.9).

Example 4.8. *Net Work*, Seventh Variation, measures 106-109. Score excerpt printed with permission, Beth Anderson.



Example 4.9. *Net Work*, Eighth Variation, measures 160-161. Score excerpt printed with permission, Beth Anderson.



It is important to remember that these sparse melodic modifications, along with some changes of rhythm and meter, are the only significant alterations that Anderson employs to create variations. Ultimately, the melody, harmony, and accompaniment changes little, which causes this piece to sound more repetitious than varied; even the key changes do little to alter the strong sense of repetition as they are not by themselves generators of linear time. Thus, while Anderson uses the well-known theme and variations form, the piece more

strongly reflects the influence of minimalism than its tonal predecessors. When understood in this postminimalist context, these slight melodic changes create a significant impact as they interact with the listener's memory and expectations. In doing so, the influence of minimalist repetition merges with postminimalist linear time through an emphasis on melodic motion and the temporal experience is neither static nor teleological but lies somewhere in between.

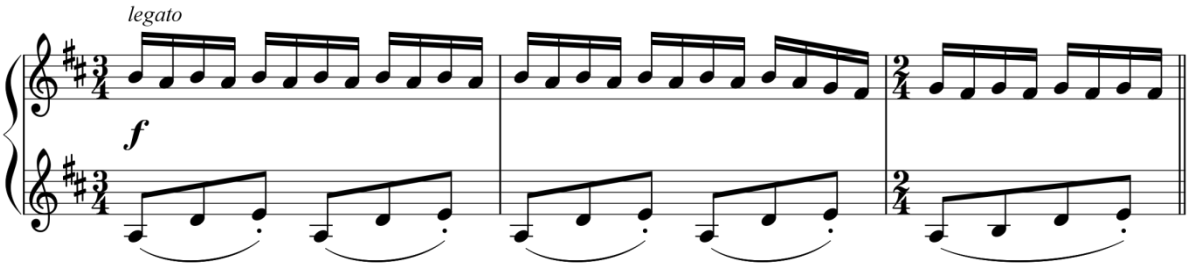
Harmonic Implications

In early minimalism, harmonic movement was either nonexistent or slowed down considerably and stripped of its implications for motion. In postminimalist piano music, which tends to use familiar triadic harmonies but not necessarily functional harmony, harmonic changes aid in creating a sense of linear time. The case of Anderson's *Net Work* is more obvious than some, with the implications of half and authentic cadences, but other works also manage to create motion in more subtle ways. James Sellar's *Sonatina* (1988) is an excellent example of this type of motion, where the harmony is not functional in the traditional sense, but still creates linearity in an otherwise static piece.

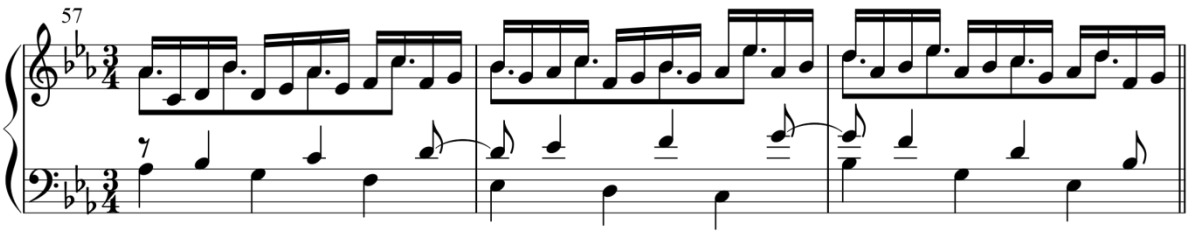
The *Sonatina* is constructed in a continuous three-section form, with tempos organized fast-slow-fast. The middle section is more lyrical compared to the outer movements, which are related to one another by their strong emphasis on rhythm and cross accents. These cross rhythms are best seen when the right hand has sixteenth notes against the eighth notes of the left hand and their groupings do not line up (examples 4.10 and 4.11). To draw attention to the rhythm further, Sellars avoids any obvious melodic or thematic ideas. Typically each hand works through a pattern before independently moving on to

another, and these patterns are usually simple without much sense of linear motion. Explicit harmonies are likewise subordinate to the rhythmic complexity of the outer movements—modal inflections, dissonant intervals, and a sparse texture make it difficult to focus on any particular harmony, much less explicitly identify tonal centers. The inner section with its dissonant intervals, large leaps in the melody, and parallel perfect fifths, also helps eliminate a sense of functional harmony.

Example 4.10. James Sellar's *Sonatina* (Hartford: Hog River Music, 1988). First movement, measures 1-3. Score excerpt printed with permission, James Sellars.



Example 4.11. *Sonatina*, measures 57-59. Score excerpt printed with permission, James Sellars.



It may be tempting to conclude that there is no sense of harmonic motion, yet Sellars moves through several different modes through the entire piece, and with two exceptions the

key signatures progress through a complete circle of fifths. Granted, given the ambiguous nature of the key centers one cannot definitively say that there is an underlying root movement by descending fifth, but since there are few chromatic alterations of each key area, these diatonic pitches still retain some sense of this movement. If each key signature is read in the major mode,[13] then the piece has the following sequence of modulations: D – G – F – B^{b} – E^{b} – A^{b} – G^{b} (middle movement) – $F^{\#}$ – B – E – A – D – G. Notice that both outer movements move through six key signatures around the middle movement, creating a formal balance that prevents this sequence from feeling as though it spirals on ad infinitum.

Moreover, the title of *Sonatina* carries with it the implication of a shift away from and a return to the tonic, an expectation fulfilled by the middle section. When considering how this piece functions in time, it is interesting to consider what would happen if these changing key signatures were not present. The modal ambiguity and the emphasis on rhythm would most likely place a greater emphasis on vertical time in the outer sections.[14] The listener would become engrossed in the changing rhythmic interplay and, without any deviation from the steady stream of sixteenth notes or any melodic implications, these movements would become more present-oriented. By allowing the key centers to change somewhat frequently

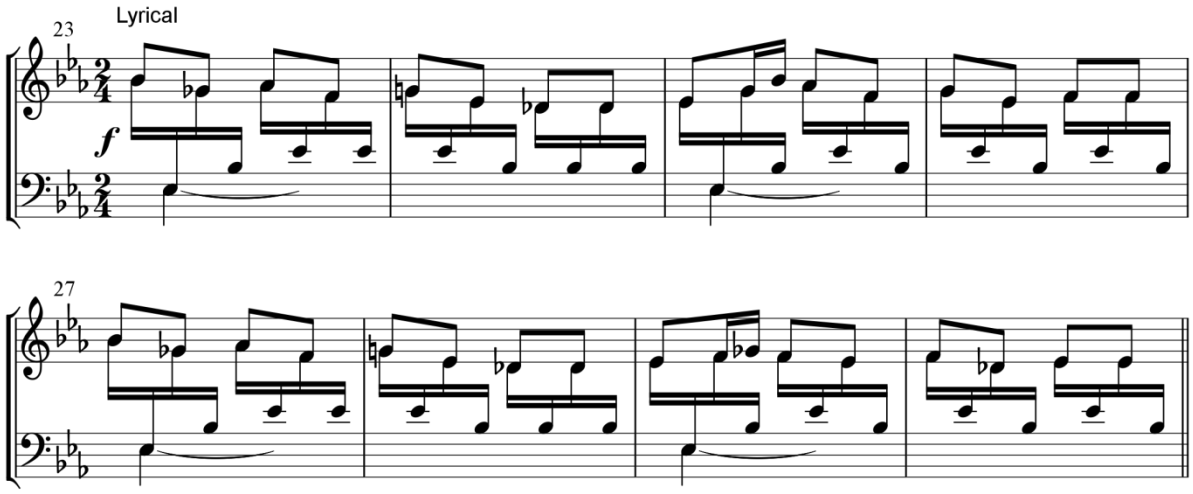
[13] Reading in this manner is obviously not the best way given the nature of this piece. Certain sections may freely move between different modal inflections while others avoid them altogether. Looking at the endings of each section, the first section seems to end in C Aeolian, the middle movement in G^{b} Lydian, and the last in B Phrygian. Still, these concluding passages neither show harmonic progression to these ending chords, nor imply the same mode throughout. Therefore, even in these clearest instances, the modality is still vague.

[14] The middle movement, with its variety of texture and melodic contours is heard in linear time within its single key signature.

and in a manner that implies strong root movement, Sellars provides enough energy to create a sense of forward progress and therefore place the piece in linear time.

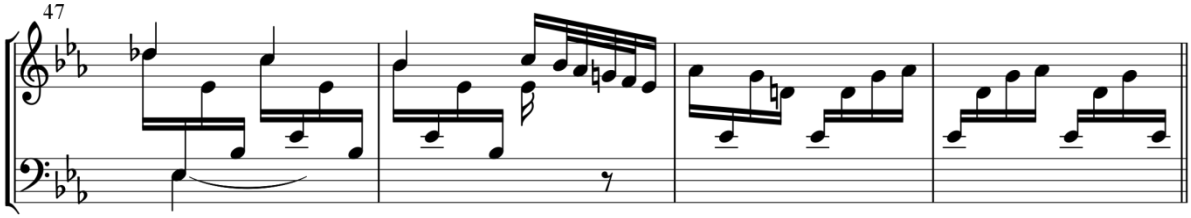
Harmonic implications in postminimalism can be more explicit than in Sellar's *Sonatina*, both serving to support phrasing and melodic implications and also to establish multiple levels of motion as can be seen in William Duckworth's *Time Curve Preludes, I*. The opening movement to the *TCP* establishes two pedal tones, the tonic E^b and D^b, a Mixolydian inflection, in the introductory material (measures 1-22). For the rest of the prelude, Duckworth establishes tension by a movement away from and a return to E^b via D^b. He then uses this tension in a variety of contexts. The first theme, measures 23-46, consists of six phrases that follow a pattern of a a' b b' a a', with the a phrases presented over E^b and the b phrases over D^b. On the small scale, the first phrase descends to D^b in the melody before ending with a half cadence on F, a harmonization of the D^b. This tension is resolved by the following parallel phrase, which ends on the tonic (example 4.12). Moving up to the next organizational level, the pedal D^b under the b phrases establishes movement away from and the necessity of returning to not only the tonic but the a phrases as well.

Example 4.12. *Time Curve Preludes, I*, phrases a and a' of the first theme, measures 23-30.



The second theme begins in measure 47 (example 4.13) and also consists of six, four-measure phrases, but it is less structured than the first as each phrase begins with the same two-measure idea followed by two measures of material derived from the introduction. The pedal point remains on the tonic for most of the second theme, with only four of the twenty-four measures having a D^b pedal. The melody emphasizes D^b-C-B^b, implying a minor dominant, creating tension as these E^b and D^b tones are presented together and in direct conflict. This tension is not fully resolved until the end of the piece, when the second theme incorporates D^b with the descending scale, creating a strong cadential figure. As can be seen from these examples the two pedal points in this prelude are used to create harmonic motion on various levels through the piece, from phrase construction to contrasting thematic ideas. By establishing the D^b as a source of tension opposed to the tonic, Duckworth is able to create a sense of linear time.

Example 4.13. *Time Curve Preludes, I*, second theme, measures 47-50. Copyright © 1979 by Henmar Press Inc. Used by permission of C. F. Peters Corp. All rights reserved.



As with other pieces discussed, however, Duckworth weakens this linearity. There are only two different harmonic areas, and while they do function in opposition to one another, the relationship is understood quickly and becomes less important as a source of linear time as the piece progresses. It would not be unlike a common practice composer electing to write a piece with only tonic and dominant chords, without the other important harmonic relationships that are normally used to strengthen the tension between the two. They can still be used to interact with the past and the future, but their ability to do so becomes quickly exhausted. Therefore, while these two harmonic areas are important in terms of allowing this piece to have a sense of linearity, they cannot fully overpower the elements of verticality, creating a type of hybrid between the two.

Form

The three elements of postminimalist music that have been discussed so far (meter and rhythm, melodic implications, and harmonic motion) interact with one another to create a sense of linear time. In doing so, they also bring about a sort of formal design. In his *Sonata*

No. 6 (Patterns on a Field) (1985), James Sellars uses a simple form to give the listener landmarks in a piece that otherwise has a strong sense of improvisation:

> *Patterns on a Field* . . . is constructed of various musical patterns, placed and displaced on a field of common time (*alla breve*). From a perspective of earlier Western music, the patterns may sound like motives, but they do not actually "motivate" the piece. Instead, they merely appear and reappear, relative to the stasis of the field. The overall form is simply the alternation of verses and refrain. Each of the verses is newly invented, whereas the refrain, though slightly varied with each appearance, always makes clear is identity.[15]

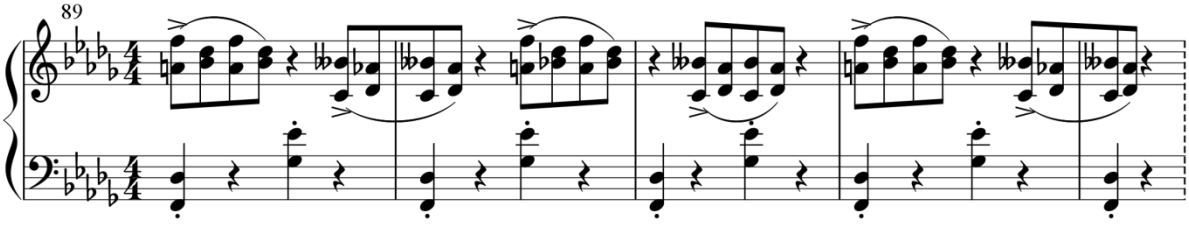
With this program note, Sellars provides a great deal of information about the elements that act to create vertical time in the piece. For instance, the musical patterns may at times seem motivic or even marked for consciousness, but they have no explicit connections to other motives and instances are without implications concerning their placement—they cannot project the piece in linear time on their own. Moreover, he describes these instances as appearing on "the stasis of the field," which is to say that not only do the motives fail to generate linear time, but they are even placed against a static background. The refrain, however, is able to interact with time not only because Sellars always presents it clearly to the listener but also because it frames the entire piece in a formal design of verses and refrain. Therefore, while his own description of the composition seems to imply a considerable amount of verticality, this one element is also able to create a noticeable sense of linear time as well.

The refrain (example 4.14) is quite short when compared to the whole piece, yet is able to organize the work in a way that it is aurally distinguishable. First, the left hand of the refrain is a return to the introduction's rhythmic pulse and a reinforcement of the *alla breve*

[15] James Sellars, *Sonata No. 6 (Patterns on a Field)*, (Hartford: Hog River Music, 1986), ii.

meter. As each verse becomes more rhythmically complex, this sudden return to a strict pulse is heard clearly. Second, the right hand in the verses often has only a single melodic line, so these accented, alternating chords also stand out from the texture. Then, as the piece progresses, the refrains become more aurally prominent with stronger implications for linear time. The first refrain is brief and not much prepared by the preceding material, but with each subsequent repetition, there are increasingly longer *allargandi* beforehand, often accompanied by sudden shifts to *fortissimo*. That each refrain should have more musical preparation shows that Sellars was interested in establishing the refrain as a source of anticipation and stability. As the expectation of its return grows after each instance, he uses more preparation to increase the level of tension, thus playing on the listener's expectations. Finally, Sellars also uses the refrain as the closing material, which not only strengthens the conclusion, but also reinforces the refrain as the primary organizational material of the piece over the continuously changing verses.

Example 4.14. James Sellars, *Patterns on a Field* (Hartford: Hog River Music, 1986), first refrain, measures 89-93. Score excerpt printed with permission, James Sellars.



To affix a label to this form outside of verses and refrain would be a mistake, as it does not carry with it the implications of other forms. Still, this form is able to not only give

the listener aural landmarks in a continuously developing piece, but also show a progression forward through time as the refrain gradually increases in prominence and importance until it concludes the work. As one of the only generators of linear time within the piece, its linear impact is weak given the many elements of vertical time, but the manner in which Sellars employs it demonstrates an interest on his part to have this interaction with time.

Another example of a postminimalist use of form can be found in Paul Epstein's *Interleavings,* "ParaPhase: (3x2)x5, 7," written in 2002. Like the ninth prelude in Duckworth's *TCP*, this work is heavily process-oriented, yet it maintains a linear time construct by using a miniature variation form. The title *Interleavings* comes from the process of combining two or more melodic lines, usually of different lengths, to form one line. "When these lengths are prime to one another, a complete cycle will juxtapose each note of one pattern with each note of the other. (A-B-C interleaved with x-y will give AxByCxAyBxCy.)"[16] For the third movement, "ParaPhase," Paul Epstein combines the patterns from two of Reich's phasing pieces, *Piano Phase* and *Violin Phase*, to create a base pattern for his processes. The "(3x2)x5, 7" then represents the number of notes in each melodic idea and how they may be combined. Once each of the four sections are set up, the process proceeds until all the melodic patterns end together.[17]

Since the structure of these processes is not wholly unlike the phasing of Reich, it is important to realize how it can be possible for this work to project itself in linear time as it still encounters elements of vertical time—no significant melodic implications and no sense

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[16] Paul Epstein, *Interleavings*, (Richfield, NC: Gold Branch Music, Inc., 2002), iii.

[17] Further analysis and examples of *Interleavings* can be found in Appendix E.

of harmonic motion.[18] Where Epstein differs from Reich is in repetition, aural clarity, and form. Reich dwelt on each new pattern that resulted from phrasing through several repetitions, as he wanted his early minimalist works to have a clear, audible process. This in turn led to the listener employing vertical listening. When asked about how *Interleavings* differed from Reich's works with respect to perception of time, Epstein wrote, "Where I differ with Reich is in not requiring that the process be readily apparent to the listener. And of course the fact that these are short pieces changes somewhat the way of listening."[19] By avoiding repetitions of and disguising each process, Epstein creates a continual sense of motion as the listener is unable to lock onto the pattern and thereby enter into vertical listening.[20]

The primary element of linear time in this work is the form. The first section acts as the theme for the work while the remaining three sections are variations on that theme. The theme (example 4.15) sets up a basic pattern where each note is heard at the eighth-note

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[18] Notice, though, that unlike Reich, who sought metrical ambiguity, Epstein's use of meter is straightforward, with downbeats receiving the only audible emphasis through the repetition of patterns. Thus there are no ambiguous subdivisions or groupings.

[19] Paul Epstein, "Re: postminimalist piano pieces.1" Personal email (8 November 2007)

[20] While the title of the piece and note in the score concerning interleaving certainly lay out the process that Epstein uses, its complexity and lack of repetition make it difficult to discern aurally. The effect is that a strict compositional logic seems to be present, but always just beyond the listener's grasp. As Kyle Gann writes, "What I get from Paul's music is a pleasurable but slightly exasperating feeling that I could figure out what the music's doing if I could just listen a little harder. . . This is a common experience for postminimalist music. . . In its most intricate form . . . it tends to create structures that sound consistent and logical, but in such a way that the ear can't quite tease out where the logic comes from." Gann, "Metametrics, Postminimalist Version," PostClassic, entry posted 19 February 2006, http://www.artsjournal.com/postclassic/2006/02/metametrics_postminimalist_ver.html (accessed 8 August 2010).

level, but the durations vary from sixteenth notes to half notes, creating variety within limited pitch material. In the first variation (example 4.16), all durations become eighth notes, creating a smoother rhythmic pattern. Epstein then combines this motion with a shift in the meter from 5/4 to 6/4 and a change of the interleaving pattern. As part of his processes, the pitches of the interleaving cells must stay the same throughout a section but may undergo octave displacement between sections. Thus, while the theme consisted mostly of leaps, the first variation has more stepwise motion within each hand, creating entirely new lines. The second and third variations then return to the interleaving pattern established in the theme, but again, have new melodic material as the notes shift within their pitch classes. The quarter-note duration also returns to emphasize both the changes between hands and the metrical pulse, creating an entirely new feel for these final two variations. The difference between these two variations is that the third variation is a quasi-inversion of the second, with the hands exchanging parts.

Example 4.15. Paul A. Epstein, *Interleavings*, "ParaPhase: (3x2)x5, 7" (Richfield, NC: Gold Branch Music, Inc., 2005), theme, measures 1-3. Score excerpt printed with permission, Paul Epstein.

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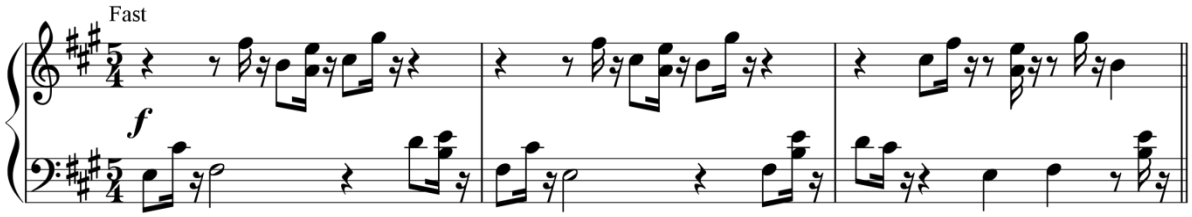
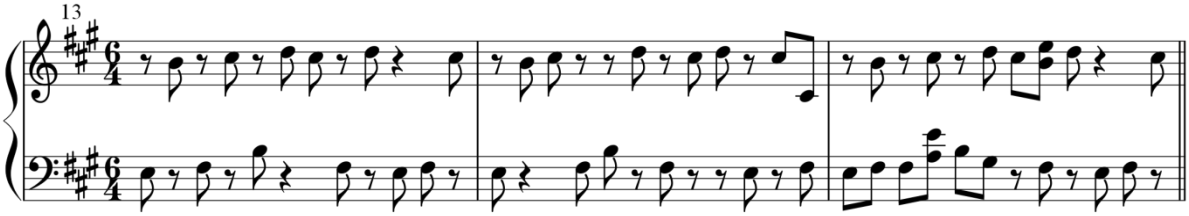


Example 4.16. "ParaPhase," first variation, measures 13-15. Score excerpt printed with permission, Paul Epstein.



When taking the whole piece into account, it becomes clear that Epstein uses minimalist materials and processes and incorporates them with linear time, a key difference between process-driven minimalist and postminimalist music. The theme and variations form in "ParaPhase" allows the process to be explored from different perspectives while the listener makes comparisons between each section across time. Likewise, the complexity of the process thwarts vertical listening to an extent as it hints at the possibility of stasis, but ultimately presents to the listener a constantly shifting landscape. Therefore, even while the process by itself does not motivate the piece through time, the nature of the variations, lack of repetition, and sheer complexity allow for a mixture of linear and vertical time to occur within this piece.

Conclusions

Postminimalist music creates a hybrid time construct by maintaining minimalist aesthetics and processes that create vertical time while also selectively including elements of linear time. Rhythm and meter, melodic implications, harmonic motion, and formal designs are some of the basic elements that postminimalist composers include to create linear time,

but their use is limited and does not carry the baggage of common practice music. Still, even such limited inclusion is sufficient to alter significantly the verticality of minimalism. Pieces such as Duckworth's *TCP, IX* and Epstein's *Interleavings,* "ParaPhase," which closely resemble their minimalist counterparts, modify the implementation of their processes to create a sense motion where before there was mostly stasis. As Duckworth wrote, "the processes I use don't take center stage, but rather hover in the background, controlling the unfolding of the music, but not becoming the center of attention."[21]

Understanding how these linear and vertical elements interact with one another is essential to understanding the listening experience of postminimalist compositions. While minimalist music tends to be mostly vertical with instances of linearity most common on lower hierarchical levels, postminimalist music creates an unrealized or weak sense of linearity due to its particular mixture of the two—the genres are differentiated by their interactions with linear and vertical time. Moreover, postminimalism is also distinct from common practice music that may have unrealized linear motion because of its inclusion of minimalist vertical elements such as pulse, repetition, and audible structure. Therefore, understanding of the musical time of postminimalism is not only essential to describing the listening experience it creates, but also to substantiate the use of the term.

[21] William Duckworth, "Re: Research Project," Personal email (29 January 2008).

CHAPTER 5

DAVID BORDEN'S *DOUBLE PORTRAIT*

Double Portrait (1987) is the result of Edmund Niemann and Nurit Tilles commissioning for their two-piano ensemble, Double Edge.[1] Being for acoustic pianos, this approximately fourteen-minute piece was a departure for David Borden, whose output largely consisted of works for his synthesizer ensemble, Mother Mallard's Portable Masterpiece Company. Borden founded the ensemble in 1969, with support from Robert Moog, and composed one of his most well known pieces, *The Continuing Story of Counterpoint* (1976-1987) for this group. This three-and-a-half hour, 12-part work combines a minimalist style similar to Philip Glass's with its intricate and pervasive use of contrapuntal techniques.[2]

Double Portrait demonstrates a similar interest in counterpoint and draws on the influence of the visual arts as well. As Borden describes the piece:

> The portrait idea comes from my long-standing fascination with this genre of painting from Rembrandt to Chuck Close. The piece begins with each player playing a distinct solo in sequence, with no break, then playing the two solos simultaneously to make a new whole. Those who know my work will

[1] Both the score and recording are available for free at http://mothermallard.com, (accessed 20 July 2010).

[2] John Rockwell, "Review/Music; A Composer's 12-Part Story of Counterpoint," *New York Times*, 8 April 1990, http://www.nytimes.com/1990/04/08/arts/review-music-a-composer-s-12-part-story-of-counterpoint.html (accessed 9 August 2010).

> recognize this approach as another manifestation of my interest in Buckminster Fuller's ideas on synergy as well as my particular approach to counterpoint. I sometimes not only combine two or more melodic ideas but also two entire keyboard parts.[3]

This combination of different ideas also extends to the temporal perspective, as the piece represents a remarkable interaction of vertical and linear time over the course of its five numbered sections and coda. It differs from other pieces discussed, both postminimalist and minimalist, in that it has a distinct shift from an opening vertical temporality to the decidedly linear and dramatic ending. By analyzing each section in order, the entire piece can be seen as large-scale change from one dominant sense of temporality to the other, demonstrating the possibility of interaction between linear and vertical time in postminimalism and the utility of my approach more fully than most compositions.

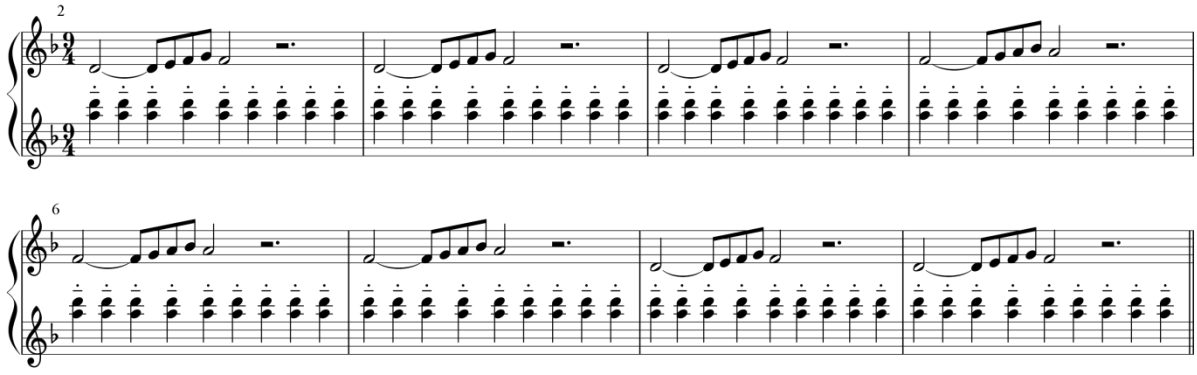
Section One

Borden establishes vertical time from the work's outset by repetition, paucity of material, and metrical ambiguity. As he described, each piano begins with a solo (examples 5.1 and 5.2) before their respective themes are combined. The first theme is a simple melodic idea in D Aeolian based on an ascending fourth. The potential for vertical time is clear in example 5.1 as this theme is repeated eight times under an unchanging, repeated harmonic fourth. The second theme is in D Dorian and is based on a descending fourth from D down to A. The accompaniment under this theme is a steady stream of sixteenth notes whose primary purpose is to reinforce the metrical shifts. In this case, the sense of vertical time is created largely by the constant pulse of the accompaniment and limited melodic

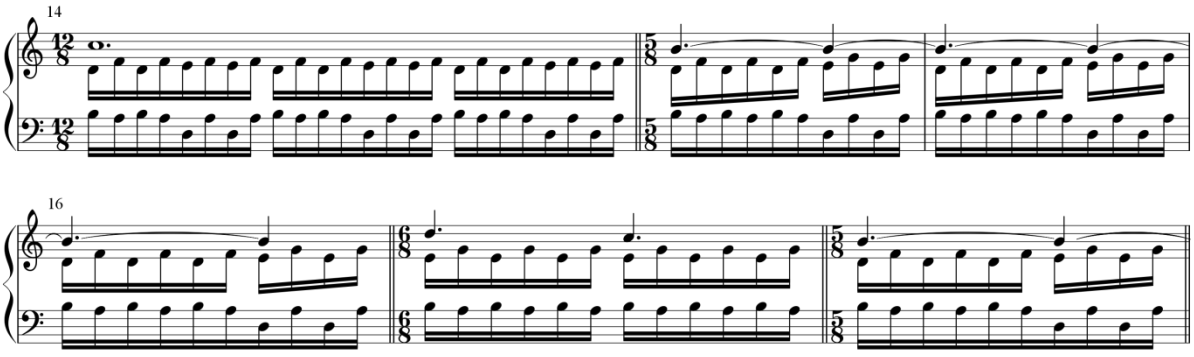
[3] David Borden, *Double Portrait* (Ithaca, NY: Lameduck Music, 1987), v.

material. The sense of vertical time increases exponentially when these two themes are combined.

Example 5.1. David Borden's *Double Portrait*, first theme, first piano, measures 2-9. Score excerpt printed with permission, David Borden.



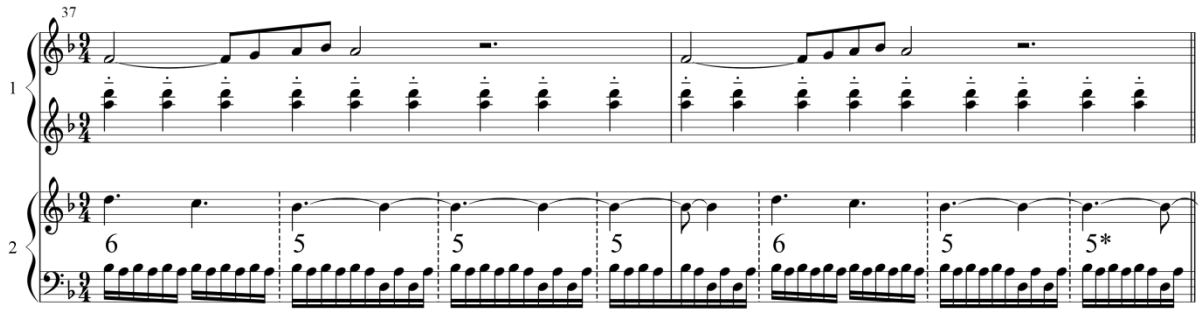
Example 5.2. *Double Portrait*, start of the second theme, second piano, measures 10-11. Score excerpt printed with permission, David Borden.



These two themes are identical in length, though their time signatures are different. The opening theme is in 9/4, but rather than having a 3+3+3 division of the meter, as might

be expected, Borden presents it as 4+5 through the durational accents of the half notes, which are each heard as strong beats compared to the passing motion on the eighth notes. The second theme is notated in a variety of time signatures, going through 12/8, 5/8 and 6/8 before concluding in 7/8. The combination of these two themes presents a great deal of metrical ambiguity, especially since their downbeats align only twice—once at the beginning and once at the fourth 9/4 measure (example 5.3).

Example 5.3. *Double Portrait*, first and second theme combined, measures 37-38. The second piano part has been re-notated to show its original time signatures. Score excerpt printed with permission, David Borden.

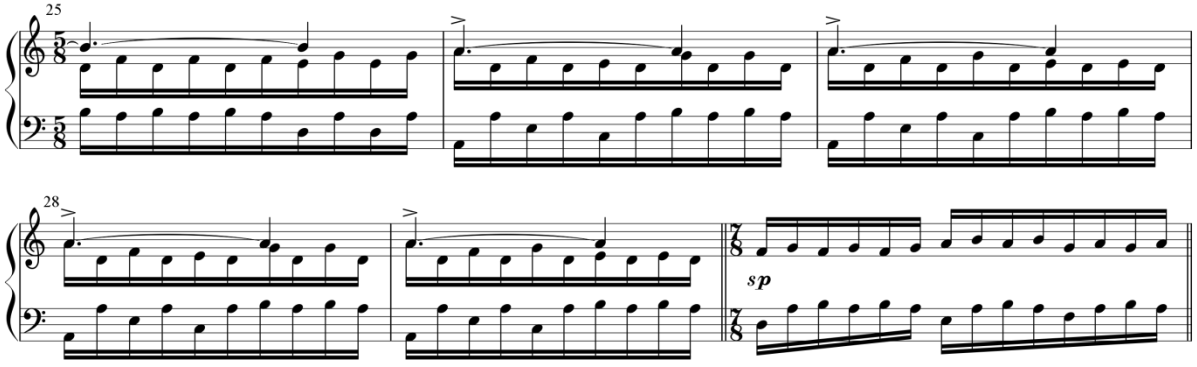


This combination encourages listener freedom as the basic material does not substantially change and neither metrical organization dominates the other. In example 5.3, the steady 9/4 meter of the first piano is set in contrast with alternating measures of 6/8 and 5/8 in the second piano, and the listener is free to focus on part one, part two, or even the overall mixture between them. This synthesis of themes is also presented three times, concluding the first section, with the only significant alteration each being the mode—Aeolian, Phrygian, and Dorian—as the tonic remains the same. Therefore, when also

considering the limited musical material, repetition, and emphasis on pulse, the sense of vertical time is strong at the beginning of this piece.

Still, elements of linearity are present, even if they are weakened by the sense of vertical time, and as the piece progresses their implications become stronger and more fully realized. The first element is the interplay of melody and harmony as a tonic/dominant relationship is established in both themes. The first theme begins on D and ends on $\hat{3}$, emphasizing the tonic chord. It is then sequenced up a third, ending on $\hat{5}$, which combined with the motion to and from $\hat{6}$ creates a dominant feel despite the static accompaniment. After three iterations at this higher pitch level, it returns back to the tonic, and when the tonic is heard immediately after $\hat{5}$ there is a sense of resolution of this implied dominant harmony. The second piano establishes tension between the tonic and dominant even more clearly as the accompaniment reinforces the relationship. When the melodic line finally completes the movement from D down to A in measure 26, the left-hand accompaniment likewise extends down to a dominant chord, after which both parts resolve back to tonic in measure 30 (example 5.4). When the themes are combined, the movements away from and back to the tonic do not coincide, making this motion less significant but enough to establish the future melodic and harmonic implications.

Example 5.4. *Double Portrait*, second theme, second piano, measures 25-30. Score excerpt printed with permission, David Borden.



A second element of linearity hinted at in this first section is the metrical disparity between the two themes. Although it is primarily used to encourage listener freedom at this point, as the piece progresses, this disparity will signal greater harmonic movement, a change from one section to another, and even the introduction of new thematic ideas. Moreover, the level of metrical interaction varies considerably beyond this section, as one piano part may take precedence over the other, creating a greater sense of stability, or as each hand may be in its own meter, creating greater tension. Borden is using the meter proactively not only to represent these two different themes, but also to create a sense of tension and resolution propels the music forward in time.

Finally, even with the ambiguity created by combining these two different themes, there is compelling motion forward to the conclusion of each iteration as the second theme's resolution to tonic also marks a change in the musical material. Instead of continuing with the same accompanimental figures supporting a melodic line, the melodic line is abandoned in favor of new pattern in 7/8 (example 5.4, measure 30) that is repeated four times. While the

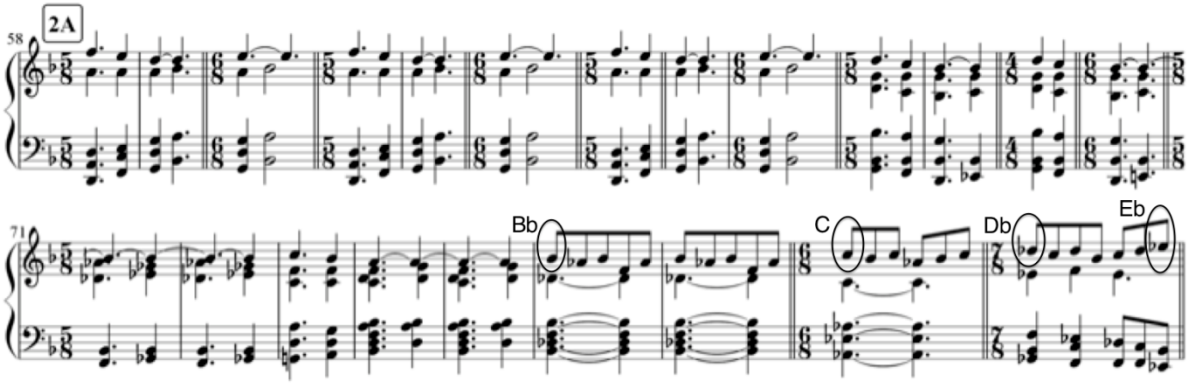
first theme and previous melodic motion of the second theme took multiple measures to establish and then realize their respective goals, this pattern creates a sense of motion within a single measure. Here, the right hand implies a $\hat{1}$ - $\hat{3}$ - $\hat{2}$ motion that also establishes tension against the bass notes, creating the need for resolution. This figure is then brought to the forefront within this combined texture, given its short-term motion and change from previous material, and it also signals a coming change. Reinforced by a *crescendo*, it causes the listener to anticipate what may be coming based on past events. This sense of propulsion into an altered repetition or a new section continues beyond this first section as similar figures are found throughout this piece. Even while this is a more localized instance of linearity, it, like the other elements, has the potential to be more significant as the piece continues.

Section Two

The rest of *Double Portrait* is based entirely on material from the first section, and within only the second section the first significant sense of linear time is heard. Previous elements of verticality remain (the constant sense of pulse, large-scale repetition, and listener freedom), but the sense of forward momentum becomes increasingly strong as this section progresses. The structure does not establish that momentum, especially since it continues the modal exploration through repetition that occurred when the first two themes were combined in section one. In fact, the first piano part remains the same through five repetitions, moving through D Aeolian, D^b Lydian, D Phrygian, E^b Aeolian, and D Dorian. While this key progression does have slight movement away from and back to D as tonic, any sense of linear motion is undermined by the repetition in each. However, each of these repetitions

does have a richer harmonic vocabulary, moving well beyond the tonic/dominant relationship of the first section and creating a greater sense of linear motion within each repetition as there are more frequent and varied instances of tension and resolution (example 5.5).

Example 5.5. *Double Portrait*, second section, complete textural reduction of the first iteration, first piano, measures 58-79. Score excerpt printed with permission, David Borden.



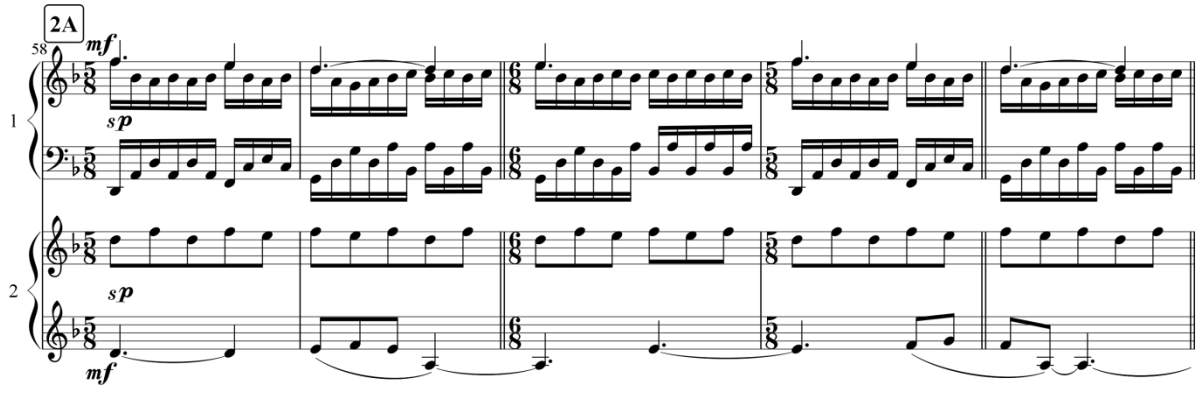
This example also demonstrates the increased importance of the movement into the next repetition, which was seen to an extent with the first section (example 5.4, measure 30). Here, the change of texture begins in measure 76, with the previously slow-moving melody being replaced by eighth notes and the clear change of tonality occurring underneath. This new melodic line also carries with it a greater sense of expectation as it slowly ascends from B^b in measures 76-77, through C in measure 78, to D^b and finally E^b in measure 79, leading to the F that would start the next repetition. The increasing length of measures also contributes to the listener's anticipation by delaying this arrival on F, creating a strong sense of localized linear motion. Naturally, as was the case with the greater harmonic implications,

the five repetitions of these twenty-two measures considerably weakens the sense of linearity created by this line. It is the second piano part that overcomes the verticality of the repetitions by continuously changing through this entire section.

For the first two repetitions in this section, the second piano has an altered version of the first theme set against an augmented version of the accompaniment to the second theme. This altered first theme explores a relatively wide range compared to its original presentation, but is dwarfed somewhat by the register and activity of the first piano (example 5.6). In the following three repetitions, Borden begins to use counterpoint increase the level of complexity. As he describes:

> This section explores a previous accompaniment figure in augmentation, bringing it more to the foreground, eventually joined in two-part counterpoint to form a kind of crab canon. This develops into three-part counterpoint using the same augmented figure in inversion finally joined by the opening five-note melodic figure in retrograde so that Player Two's part for the second section ends in four-part counterpoint.[4]

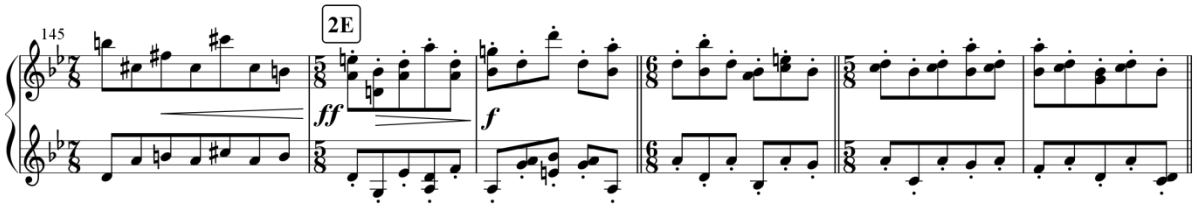
Example 5.6. *Double Portrait*, measures 58-62. Score excerpt printed with permission, David Borden.



[4] David Borden, *Double Portrait*, v.

These contrapuntal techniques are difficult to hear as the accompaniment figure in augmentation is a steady stream of eighth notes. What is more noticeable is an increase in density and activity, which in this case also contributes to linear time. Given that the first piano is relatively constant, this contrapuntal build-up is the only significant source linearity across repetitions. To enhance this effect, the dynamics become gradually louder along with the density, increasing the sense of a momentum through to the end of this section. In the final repetition, the second piano shifts to a staccato articulation, driving this section forward to its conclusion (example 5.7). Without this increasing contrapuntal density and linear projection across the repetitions, the aspects of vertical time in this section would lessen the effect of the harmonic and melodic implications of the first piano. As Borden allowed for linearity only on the local level in the first section, he now expands its potential to act on the level of an entire section through his use of counterpoint.

Example 5.7. *Double Portrait*, second piano, measures 145-150. Score excerpt printed with permission, David Borden.

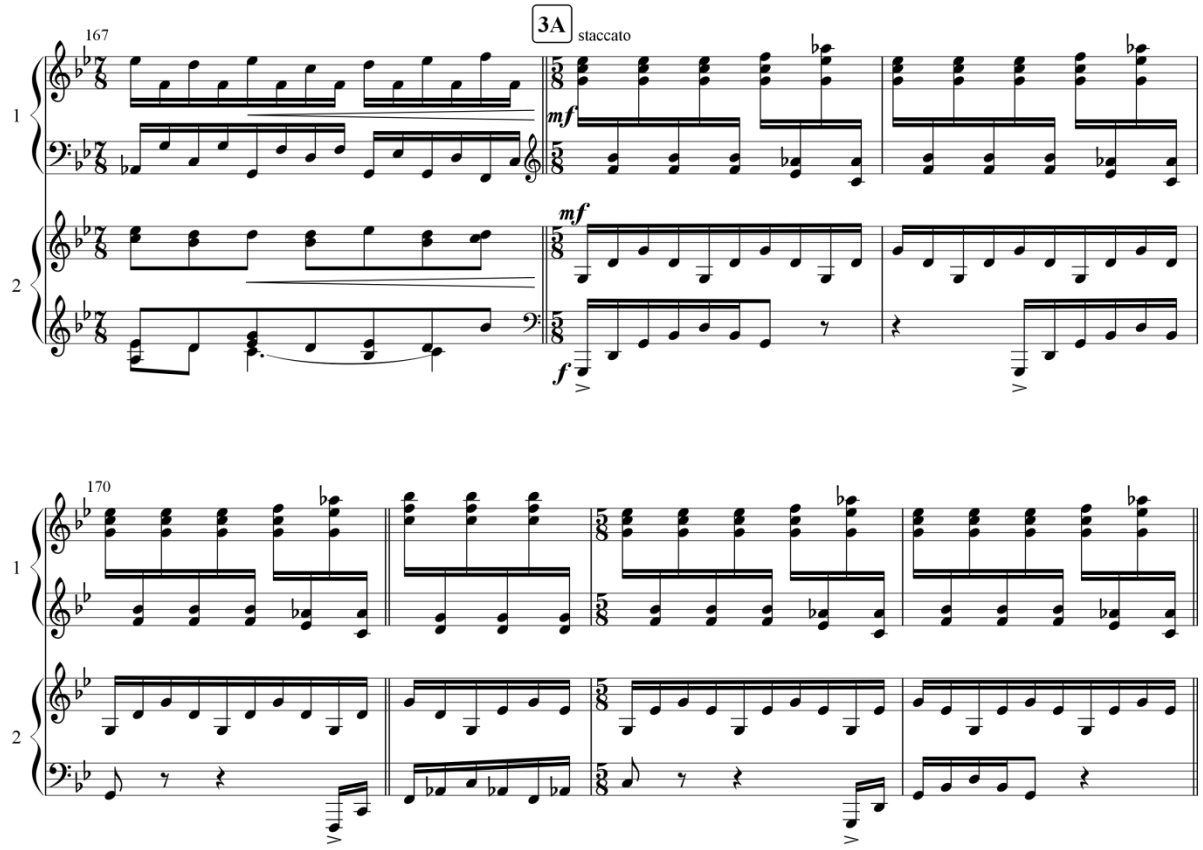


Section Three

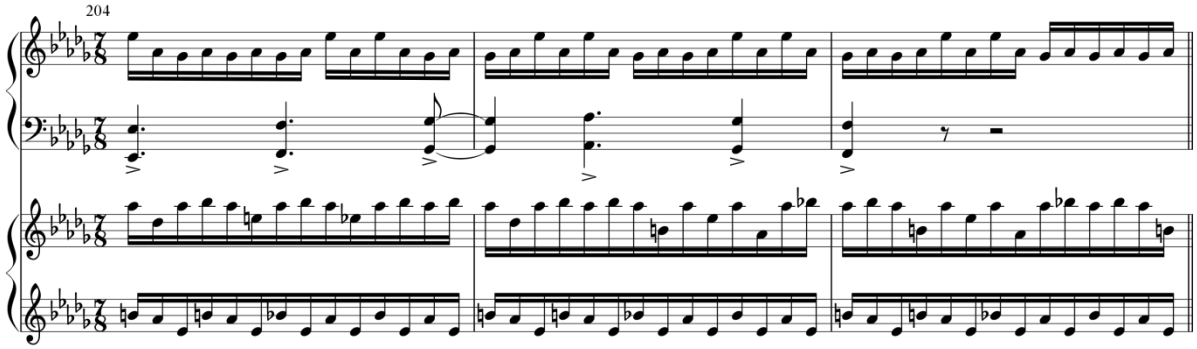
The sense of headlong push Borden established in the second section wanes somewhat in section three, even though Borden describes it as "adding an intensity that wasn't present before."[5] The cause for this increased intensity is the expansion into the lower register of the piano and a greater density of notes, but neither necessarily generates additional linear motion—there is actually an increased clarity of texture because of the increase in density. Whereas in the previous two sections the density included multiple melodic lines with different profiles and rhythmic durations, the density in section three is much more accompanimental through steady sixteenth notes. In examples 5.8 and 5.9, two figures stand out easily from this texture—the new arpeggio figure and the first theme set in octaves, respectively—both because of their lower placement on the keyboard and different rhythmic profile. If anything, this increased density serves to highlight these two figures rather than obscuring them, creating the clearest texture since the opening solos.

[5] David Borden, *Double Portrait*, v.

Example 5.8. *Double Portrait*, transition into the third section with the arpeggio figure in the second piano, measures 167-174. Score excerpt printed with permission, David Borden.



Example 5.9. *Double Portrait*, octave theme in the first piano part, measures 204-206. Score excerpt printed with permission, David Borden.



The increase of intensity is also present as both of these themes, in addition to being in a new register, contrast the previous sections' fluidity. Still, while the second section gradually increased the forward momentum and importance of melodic implications, these themes do little to increase the sense of linear time. If anything, linear time on the local and sectional levels has diminished. The arpeggio figure by itself serves only to establish tonic as it is sometimes coupled with a presentation of the figure a whole-step lower, creating a i-^{b}vii-i motion. This relationship does establish a means of creating tension and resolution, but it is simple, quickly understood, and lacking the harmonic richness of the second section. The octave theme, based on the first theme, does carry some linear implications. In this section, it is often presented beginning on $\hat{5}$, which sets up two forms of dissonance. First, the theme terminates on $\hat{6}$, which has a strong pull to $\hat{5}$ that remains unresolved, and second, it establishes the dominant tension resolved by the return to the arpeggio figure on the tonic. Still, it presents only a simple relationship that is repeated multiple times through the section, and while it sometimes begins on different scale degrees, the sense of repetition diminishes the linear implications.

As these are the only two significant themes in the third section, and given that they are but weak sources of linear time, it would seem that in some ways the movement from vertical to linear time over the course of the piece has stopped. When considering the tonal areas of this section in relationship to the entire piece, it becomes clear that Borden is actually expanding the role of linear time to an even greater hierarchical level. The first section primarily established localized linearity with melodic and harmonic motion while the

second created the possibility of linearity across an entire section with the gradual accretion of contrapuntal density in the second piano. The third section establishes the potential for linearity to exist across the entire range of the piece by creating long-term harmonic motion.

Harmonically, the first two sections stray only as far as a half step away from D as tonic, and those movements carry no significant implications. In contrast, the third section begins in G Phrygian, which is related to the melodic emphasis of the ascending fourth at the beginning of the piece, and continues through A^b Aeolian and C Mixolydian before ending in F Dorian. This progression, aside from being the first departure from D, is important in establishing the formal role of the third section as well as the tonal motion of the entire piece: the piece ends in C Dorian, which is unexpected given that it started in D Dorian. This ending is possible only because of this progression, which ends a whole step lower than where it began. As such, the third section becomes a harmonic pivot between the opening sections and those that remain, establishing for the first time linear implications for the entire piece. Understood in this context, the lack of strong linear motion on the local level allows for greater focus on the higher-level harmonic motion before the push to the Coda begins.

Sections Four and Five

With linear time now established on all hierarchical levels, the remaining numbered sections reestablish and build on the sense of momentum in a final push to the coda.[6] To that end, what is most noticeable to the listener in these sections is a gradual, but substantial

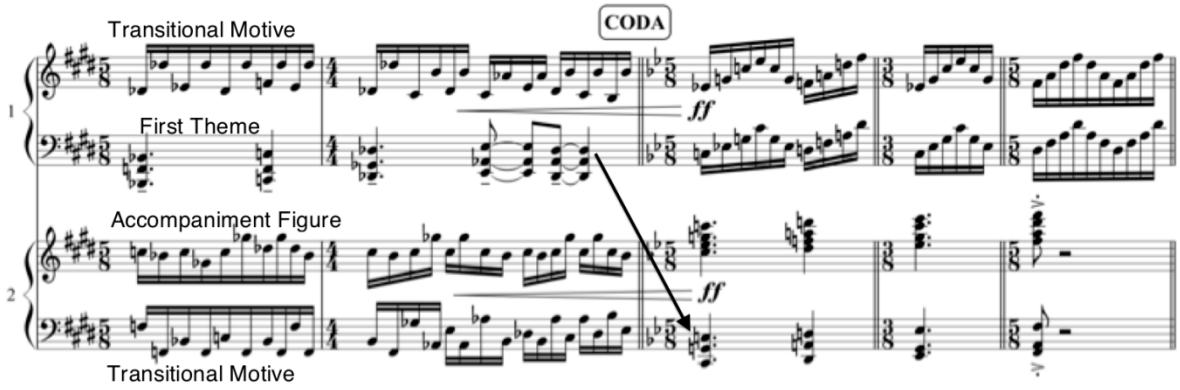
[6] Sections four and five are considered together because of their similarities, the way they flow smoothly together, and their brevity. These two sections combined are shorter than all other numbered sections. The duration of each, given in eighth notes due to the variance in key signatures, is as follows: section one – 744, section two – 580, section three – 978, section four – 237, section five – 231, and the coda – 135.

increase in activity in most respects. Modulations occur more frequently, metrical dissonance becomes more complex and changes more often, accompaniment figures become more prominent, and themes appear irregularly and in various forms. With this increase in activity comes a loss of stability, especially considering the highly ordered and structured nature of the previous sections, creating an increasingly powerful expectation for a final resolution.

In these final sections, the themes become more important as they alone stand out from the dense texture. Yet instances of the themes become fewer, creating tension as the listener anticipates their return. At the same time the most prominent theme, the first, also becomes less stable. The last two notes of this theme are often truncated, creating an ascending fourth, and it is presented in various forms, from only a single line to broken octaves and full chords. The theme also moves away from its previous focus on the dominant pitch level and begins to wander through increasingly less stable tonal areas.

The first theme's final presentation before the coda is a remarkable example of how it can produce forward motion (example 5.10). Measure 418 is the first time this theme has been heard with an additional note since the third section, but instead of creating tension by failing to complete the descent to its starting note of B^{b}, Borden uses the theme to modulate to C Dorain. Not only is C reinforced harmonically at the beginning of the coda, but it also acts as the termination of the theme in the first piano and the start of a new, four-note iteration in the second.

Example 5.10. *Double Portrait*, transition into the coda, measures 418-422. Score excerpt printed with permission, David Borden.



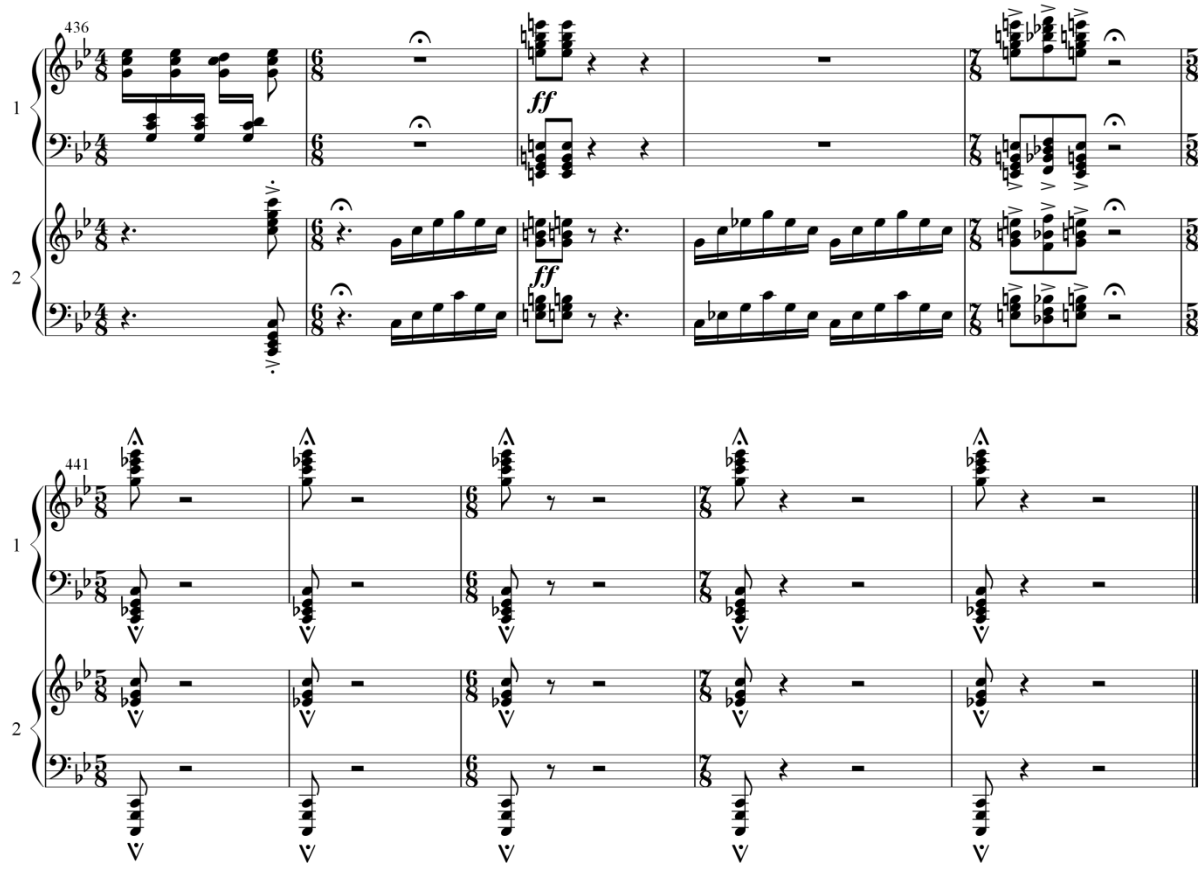
The remaining three staves in example 5.10 demonstrate the density and energy that builds to the coda. In measures 418 and 419, the right hand of the first piano part and left hand of the second are each presenting modifications of the transitional motive from section two (example 5.5, measures 76-79), but are dissonant against one another. The right hand of the second piano part has a modified version of the accompaniment figure from section three (example 5.9, first piano, right hand) and also does not seem to fit against the other parts. The effect is one of sheer activity. It is not possible to hear all these different thematic elements, so the ear instead focuses on the chordal theme being set against a dense, constantly shifting background. Were this level of linear intensity allowed to continue any longer, it would spiral into chaos. As it stands, the piece pushes to the edge of control before arriving at the coda.

Coda

As Borden describes it, "the Coda has the effect of finally reaching the clearing after a long climb. The texture, while still thick and loud, is less complex and eventually leads to some moments of silence for the first time in the piece."[7] This decrease in complexity is due to a resolution of the various tensions built up over the entire work. The metrical dissonance that has been so prevalent is eliminated as both pianos reinforce the written meter for the first time. There is also only a single theme present in the second piano, as the first piano accompanies with arpeggio figures. The harmonic instability of sections four and five also comes to a close with the firm establishment and lack of deviation from C Dorian. This tonality is reinforced by the first piano, making the impending conclusion clearly audible to the listener. Also, after a brief false cadence, C minor chords are sounded five times in both hands, covering over four octaves, with a built in metrical *ritardando* (example 5.11), erasing any doubt as to the piece's harmonic goal.

[7] David Borden, *Double Portrait*, v.

Example 5.11. *Double Portrait*, measures 436-445. Score excerpt printed with permission, David Borden.



As the performers strike the final chords, the sense of linear time is almost overwhelming. These dramatic chords seem to be the inevitable destination of increasingly potent forward motion, yet such a conclusion would have been difficult to anticipate from the work's outset. As the piece began, the few elements of localized linearity dissipated to the background as Borden combined the two solos, creating a complex metrical framework that encouraged listener exploration. The second section featured a sense of linearity on a larger scale through contrapuntal techniques, though the continued repetition of the first piano still

undermined this motion. Even the third section, which finally established the potential for long-term linearity, still held back the sense of momentum by minimizing linear motion on lower hierarchical levels. Therefore, even while the sense of linear time became increasingly apparent, it continued to be constrained by the same vertical elements that were present at the beginning of the work.

Finally, in the remaining sections, which comprise only a fifth of the entire piece,[8] the final vestiges of verticality are overwhelmed, leading to a stunning conclusion. What seems in retrospect to be a gradual accretion of momentum from the beginning to the end of this work is best understood as a transition from vertical time to linear time. Regarded in this context, *Double Portrait* can be seen as an archetype for the potential interaction of these seemingly disparate temporal constructs—they are both dominant at different points in the piece, simultaneously present on different hierarchical levels, and even blended together. At the same time, no other postminimalist or minimalist composition that has been discussed demonstrates such a rich array of changing interactions. While they create musical time with elements of linearity and verticality and are best understood in this way, they do not possess the same level of variety.

Postminimalist pieces tend to have limited interaction between linear and vertical time as the elements of each do not significantly change during the piece. The listener understands the musical time of a piece from its beginning and does not expect it to deviate. This is even more true with minimalist music. While Tom Johnson created a musical time with *An Hour for Piano* that also interacted with clock time, allowing for the full range of

[8] There are only 603 eighth notes from the start of section four to the end of the composition, which is only 20.8% of the overall piece (603/2905).

temporal experiences (protracted duration, synchronicity, and temporal compression), it still does not have *Double Portrait's* diversity of linear and vertical elements. What Borden was able to achieve in this piece from a temporal perspective is nothing short of remarkable—he not only demonstrates the potential for interaction between linear and vertical time, but also its fullest potential. With this large-scale shift from vertical to linear time, this piece also embodies the shift from minimalism to postminimalism.

In the first section, only a hint of linearity was present at the local level. In the second, the possibility of sectional linearity arose, but even when the third section established linear implications across the entire piece the localize linearity was diminished. Borden uses nearly eighty percent of the piece to create linearity out of verticality, but once established the linearity is extraordinarily potent. This creates a stark difference between *Double Portrait* and its minimalist predecessors, but at the same time the minimalist aesthetic remains. This temporal perspective for analysis is therefore indispensable as it able to establish a distinct difference between minimalist and postminimalist works while also providing the means to understand them individually.

CHAPTER 6

CONCLUSIONS

Theorists have struggled with minimalism somewhat more than their musicology colleagues, who remain mostly united in the significance of four composers—La Monte Young, Terry Riley, Steve Reich, and Philip Glass. Moreover, there exists a wealth of source material that musicologists continue to mine for their research. On the other hand, minimalist music presents startlingly little information for theorists. Traditional analytical techniques are designed to delve beneath the surface of the music, but minimalist composers seemed to have no interest in creating anything but surface-level music. Not surprisingly, formalist analyses, as Ian Quinn describes them, largely fail to generate meaningful conclusions about this music.[1] As Jonathan Kramer wrote, "It is essentially pointless to explicate."[2]

Still, while several authors contend that other analytical approaches are therefore necessary, such as Jonathan Bernard's inclusion of minimalist art in analysis, many have

[1] Ian Quinn, "Minimal Challenges: Process Music and the Uses of Formalist Analysis," *Contemporary Music Review* 25, no. 3 (June 2006): 292-293.

[2] Jonathan Kramer, *The Time of Music*, (New York: Schirmer Books, 1988), 388.

continued to pursue a formalist approach.[3] Some successful examples of this have been Richard Cohn and Paul Epstein, who looked at the phase-shifting music of Steve Reich.[4] Yet the essential problem with these analyses, and those like them, remains: formalist analytical procedures most commonly seek to understand deeper structural levels of the music, but minimalist composers were interested in structure that was not only simple, but audible as well. Their focus was to create an experience that encouraged listener freedom by being non-manipulative; they were more concerned with mining a type of musical time that was largely unexplored in Western classical music, and their compositional approaches were a means to that end. These pieces are hardly uniform in their approach to this idea, and so too the experiences that each piece creates, but this concept remains central to minimalist music.

Unfortunately, even when authors address the experience of time with minimalist music they tend to use general terms that are not specific to any piece or even composer. Kramer's *The Time of Music* is one of the best and most comprehensive works on the subject of time, and his writing on vertical time is incredibly important, but even he uses vertical time as an umbrella term for the musical time of an extremely wide-range of musical styles.[5] Therefore, while describing minimalist music as creating vertical time goes a long way to

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[3] Jonathan Bernard, "Theory, Analysis, and the 'Problem' of Minimal Music," in *Concert Music, Rock, and Jazz Since 1945: Essays and Analytical Studies*, ed. Elizabeth West Marvin and Richard Hermann (Rochester: University of Rochester Press, 1995), 266.

[4] Richard Cohn, "Transpositional Combination of Beat-Class Sets in Steve Reich's Phase-Shifting Music," *Perspectives of New Music* 30, no. 2 (1992), 146-177; Paul Epstein, "Pattern Structure and Process in Steve Reich's *Piano Phase*," *The Musical Quarterly* 72, no. 4 (1986), 494-502.

[5] Consider Kramer's "Personal experiences with timelessness," which describes two extremely different musical experiences as creating vertical time in section 12.2. *The Time of Music*, 378-381.

understanding the experience, the term remains too general and broad to be meaningful for analysis of individual pieces. The solution to this problem is in allowing for an interaction of vertical time and linear time.

This interaction, while seemingly impossible, has long been acknowledged by different authors. J. T. Fraser established the possibility when he wrote that "time refuses to conform to the law of contradiction," and both Kramer and Jann Pasler allow for a fluidity between their classification of different species of time.[6] Since so few minimalist pieces create pure vertical time, this sense of fluidity is essential to understanding the musical time of individual compositions. Moreover, with an understanding of the musical elements that create vertical time—repetition, pulse, and audible structure—formalist analyses become more powerful as they can address the interaction between these and the more traditional elements of linear time, thereby more accurately describing the listening experience.

I applied this analytical process to three early minimalist works: Terry Riley's *Keyboard Study no. 1*, Steve Reich's *Piano Phase*, and Philip Glass's *Two Pages*. While it was evident that the different compositional approaches did create different listening experiences, conclusions also emerged that are applicable to minimalist music in general. First, minimalist music is rarely devoid of linear influences, even if they are but by-products of rigorous compositional procedures. These linear elements are often different from one piece to another, but are almost always present. Second, linearity is most pronounced on the local level as it becomes increasingly difficult to affect the strength of vertical elements on

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[6] J. T. Fraser, *Of Time, Passion, and Knowledge* (Princeton: Princeton University Press, 1975), 45; Kramer, 8; Jann Pasler, "Narrative and Narrativity in Music," in *Time and Mind: Interdisciplinary Issues*, ed. J. T. Fraser (Madison, CT: International Universities Press, Inc, 1989), 247.

larger structural levels. It is common for there to be brief moments of anticipation or recall, but prominent, large-scale linearity is not a characteristic of minimalist music.

The large-scale analysis of Tom Johnson's *An Hour for Piano* reinforced these conclusions, but also demonstrated how a minimalist piece that does not follow strict procedures can create a strong sense of vertical time. Moreover, this piece exhibited a wide range of interaction with several different types of time—musical, psychological, and objective. The deliberate interaction with clock time comes from Johnson's intention to have the piece last for exactly one hour and to also make the audience aware of this fact. It is rare for any piece to be so deliberately related to its actual duration, and even more rare for minimalist compositions, which sought to create a sense of timelessness. Through musical elements, such as imitation of the ticking of a clock, and imaginative program notes, Johnson is able to weave clock time into the hearing of the piece, bringing the psychological effect of synchronicity alongside the protracted duration and temporal compression that minimalism usually exhibits. This richness of interaction not only distinguishes *An Hour for Piano* from other minimalist compositions, but also demonstrates the tremendous importance of time as a factor in any analysis of the piece.

The interaction between linear and vertical time is also important for postminimalism. This style freely incorporates the aesthetics and techniques of minimalism with a variety other influences, which tends to create an overall experience that hovers somewhere between the vertical time of minimalism and the linear time of common practice music. While this combination ties in well to the analytical model already developed, it also means that postminimalism tends to be rather diverse, both in terms of musical time as well as in

aesthetics. Consequently, there has been some dispute as to what the term postminimalism means, with some such as Kyle Gann and Dimitri Cervo developing different definitions while others such as Bernard rejecting the term outright.[7] By understanding postminimalist compositions in terms of the musical time, though, it becomes clear that they create a hybrid of linear and vertical time, distinguishing postminimalism from other styles and helping to legitimize and clarify the use of the term.

Brief analysis of postminimalist pieces by William Duckworth, Peter Garland, Beth Anderson, James Sellars, and Paul Epstein showed that linear musical elements are more prominent and potent than they are in minimalist compositions. Rhythm and meter, melodic implications, harmonic motion, and formal design are often present in postminimalist works, and they are not limited to affecting perception on the local level, as was the case in minimalism. At the same time, the inclusion of strong vertical elements considerably weakens linearity without overwhelming it. Thus, a hybrid musical time is created that is distinct in postminimalism, and it is only this analytical approach that makes this distinction possible.

With this understanding of postminimalism, David Borden's *Double Portrait* becomes the archetype for the genre. While most pieces, minimalist and postminimalist, do not substantially alter the general sense of musical time during piece, *Double Portrait* exhibits the full range of possible interactions. At the beginning, it is nearly vertical, with

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[7] Dimitri Cervo, "Post-minimalism: A Valid Terminology?" *Ictus* 1 (Dec 1999): 42; Kyle Gann, "Minimal Music, Maximal Impact," New Music Box, 1 November 2001, http://www.newmusicbox.org/page.nmbx?id=31tp05 (1 August 2010); Jonathan A. Bernard, "Minimalism, Postminimalism, and the Resurgence of Tonality in Recent American Music," *American Music* 21, no. 1 (Spring 2003): 130.

only small, localized instances of linearity. As the piece progresses, the elements of linearity become increasing more powerful, first expanding their influence to entire sections and eventually to the piece as a whole. By the conclusion, the sense of linear time has all but overwhelmed any traces of verticality, leading to a dramatic conclusion, yet this outcome was far from expected when the piece began. Just as Tom Johnson did with *An Hour for Piano*, which created a variety of interactions with different types of time (musical, psychological, and objective), David Borden in *Double Portrait* explores a complete spectrum of interaction within musical time. Both pieces are therefore landmarks of their respective genres, though without this analytical model it would not be possible to grasp fully their significance.

There are other implications to these potential interactions that are not discussed in this study. Since it has been limited to piano music, there are certain constraints on this music that are not found in other instrumental and vocal works. For instance, the piano is limited in its capacity to sustain tones and to create a wide variety of timbres, and composers often use these two elements to influence musical time. Drones are common in many minimalist pieces and can be used to create vertical time. Likewise, timbre and instrumentation have a strong effect on time, whether to heighten tension or even soften other linear elements. These and other particular musical elements of both linear and vertical time will need to be addressed in future research, though the analysis of piano music does provide a broad foundation for that work.

Another avenue that is ripe for future research is looking at the later works of the early minimalist composers. Most analytical work tends to address pieces written before

1976, and it would be interesting to see how the inclusion of more linear elements affected the music of composers such as Reich and Glass. This might also lead to an interesting comparison between these works and postminimalist pieces, as they share many characteristics, and it may also clarify when and how they moved beyond a sort of "mature minimalism" into newer styles. Likewise, applying this analytical approach to operas, such as those by Glass and John Adams, could yield some intriguing results. While text was briefly discussed in relation to *An Hour for Piano*, such as a study would need to consider text much more substantially, as well as other extra-musical elements such as staging or even lighting that might influence the perception of time.

The inclusion of different species of time could be beneficial for analysis of any music in recent decades, especially as the unironic use of tonality and elements of common practice music become more common and accepted. This analytical approach could illuminate implications of tonal quotes in postmodern music as these are juxtaposed with a variety of influences, including those that are nonlinear. It could also show how neo-tonal or neo-romantic music differs from its common practice predecessors and contemporary trends such as postminimalism. Totalism, another response to minimalism, creates an intriguing temporal space through its layering of meters and metrical subdivisions. This term is only beginning to gain wider acceptance, and temporality could further define the style and distinguish it from other trends.

At the very least, it is difficult in light of this study to understate the importance musical time when discussing minimalism or postminimalism. With minimalism, composers were deliberately creating a musical time that allowed for listener freedom. To that end, the

pieces tend to be non-manipulative and employ many musical elements that create vertical time. Yet composers found a variety of means to achieve this effect, and simply describing them as existing in vertical time does not account for these differences. Instead, the richness and variety of minimalism (which many fail to see) can be better understood through an interaction of linear and vertical elements, which in turn more accurately and fully explains the listening experiences that these pieces create. Likewise, postminimalism seems to defy conventional explanations as its musical time is simultaneously linear and vertical. Understanding this genre, and its distinctiveness from minimalism and other genres, requires an understanding of musical time. Otherwise the diverse influences within postminimalism overwhelm any attempts at cohesive definition. Perhaps more importantly, this analytical approach can reveal the exquisiteness of otherwise overlooked compositions. Neither *An Hour for Piano* nor *Double Portrait* is particularly well known, which is unfortunate. Both of these pieces are stunning in their interaction with and creation of time, and the only way to reveal their full beauty is to understand that linear and vertical time are far from mutually exclusive, but instead can interact on a variety of different levels to create a rich temporal experience.

Addressing temporality solves the problem that formalist analysis encounters with minimalism and postminimalim, showing that the deceptively simple nature of this music contains a rich mixture of temporalities that act together to form the listening experience. Moreover, it is evident that the enormous changes that took place in the latter-half of the twentieth century do not make formalist analysis irrelevant. As research continues to explore the range of temporalities, the musical elements that create them, and the interactions among

them, the potency of this analytical approach will continue to expand. Just as scholars have found common practice music to be fertile ground for temporal exploration, so to will those willing to adapt these concepts to more recent compositional developments. If anything, the possibilities are even greater with twentieth and twenty-first century music as the influences and compositional procedures are more varied. The need is also greater as the recency of some styles means that codification is still taking place, and the analysis of musical time will crucial to that process. "Without time, there is no music,"[8] and if compositions deliberately thwart common practice temporality, it is essential their analyses consider the interaction and creation of this intrinsic musical element.

[8] Alan Marsden, *Representing Musical Time: A Temporal-Logical Approach* (Lisse: Swets & Zeitlinger, 2000), 1.

APPENDIX A

BRIEF BIOGRAPHICAL INFORMATION OF POSTMINIMALIST COMPOSERS

All information in this appendix is taken from each composer's publicity materials as indicated in the footnote for each.

Beth Anderson[1]

Beth Anderson (M.F.A./M.A.) is a critically acclaimed composer of neo-romantic, avant-garde music, text-sound works, and musical theater. Born in Kentucky, she studied primarily in California with John Cage, Terry Riley, Robert Ashley and Larry Austin at Mills College and U.C. Davis. She is a member of Broadcast Musicians Inc. (BMI), the American Composers' Forum, International Alliance of Women in Music, the American Music Center, Poets and Writers and New York Women Composers. She resides in New York City where she produces Women's Work, a concert series, for Greenwich House Arts.

[1] Beth Anderson, "Beth Anderson, Composer," http://www.beand.com/ (accessed 29 September 2010).

David Borden[2]

David Borden was educated at the Eastman School of Music and Harvard University. He was also a Fulbright student in Berlin Germany, where he studied at the Hochschule für Musik. He founded Mother Mallard's Portable Masterpiece Co. in 1969 with the generous support of Robert Moog. The group became the world's first synthesizer ensemble. "Mother Mallard turns out some of the best synthesizer music around." - New York Times. His *The Continuing Story of Counterpoint*, a twelve-part cycle of pieces for synthesizers, acoustic instruments and voice has been called the "*Goldberg Variations* of minimalism." Borden's music is available on the Cuneiform, New World Records, Lameduck and Arbiter labels. . . . He is the retired founder and Director of the Digital Music Program at Cornell University.

Paul Epstein[3]

Paul A. Epstein is Professor Emeritus of Music Theory at Temple University, where he taught from 1969 to 2001. Born in Boston in 1938, he is a graduate of Brandeis University and the University of California at Berkeley. His composition teachers included Harold Shapero, Seymour Shifrin, and Luciano Berio, with whom he studied privately on a Fulbright grant to Italy in 1962-63. Epstein has been involved in closely collaborative work with artists in theater and dance. He was associated with the New York environmental theater group The

[2] David Borden, "About David Borden," Mother Mallad, http://web.mac.com/rebeccagodin/David/David_Borden.html (accessed 29 September 2010).

[3] Paul Epstein, "Paul A. Epstein," Society of Composers, http://www.societyofcomposers.org/user/paulepstein.html (accessed 29 September 2010).

Performance Group from 1969 to 1972, and from 1974 to 1987 he was composer and music director for ZeroMoving Dance Company of Philadelphia.

Peter Garland[4]

Peter Garland was born in 1952 in Maine. He studied with Harold Budd and James Tenney at Cal Arts and has had long student-mentor friendships with Lou Harrison, Conlon Nancarrow, Paul Bowles and the late Dane Rudhyar. He edited and published *Soundings Press* for twenty years, and has written two books of essays on American music and culture. He has been a lifelong student of Native American musics, and has lived in New Mexico, California, Maine, Michoacan, Oaxaca and Puebla. His musical works after 1971 were marked by a return to a radical consonance and a simplification of formal structure influenced by Cage, Harrison, early minimalism and an interest in world musics. He has written pieces for pianists Aki Takahashi and Herbert Henck, percussionists William Winant and Chris Shultis, accordionist Guy Klucesvek, the Abel-Steinberg-Winant Trio and the Kronos Quartet. He has also worked as a musician in shadow puppet theater, especially in his *The Conquest of Mexico* (1977-80), performed at the 1985 New Music America Festival in Los Angeles. In 1991, Essential Music in New York City presented a twenty-year retrospective of Garland's work. Garland has worked with William Winant since 1972, and has had a long and close musical association with Aki Takahashi.

[4] Peter Garland, "Peter Garland," New Albion Records, http://www.newalbion.com/artists/garlandp/ (accessed 29 September 2010).

James Sellars[5]

At age 17, James Sellars left his native Arkansas to study composition at Juilliard and Manhattan School of Music, where his principal teachers were David Diamond and Ludmila Ulehla. He later took a Ph.D. at North Texas University, and presently divides his time between New York and Hartford, where he is on the composition-theory faculty at The Hartt School. . . . Sellars's latest compositions include *Don't Stop*, written for the Bang On A Can All-Stars and premiered at Lincoln Center, May 1996, and *Afterwards* for orchestra, premiered the same year by the New Hampshire Symphony Orchestra. In May 1998, The California EAR Unit introduced his ensemble work, *GO!*, at the Los Angeles County Museum of Art, and in September 2000, the Lions Gate Trio gave the premiere of his Piano Trio. In progress is *The Turing Opera*, a high-tech stage piece with a libretto by poet Thomas Meyer, based on the life of English mathematician Alan Turing.

William Duckworth[6]

Born in North Carolina in 1943, William Duckworth was educated at East Carolina University and the University of Illinois, where he studied composition with microtonal composer Ben Johnston, himself a student of John Cage and Harry Partch. Duckworth has taught at Bucknell University since 1973. . . . In addition to numerous teaching awards—Rolling Stone magazine called his teaching hip, bright, and innovative,—Duckworth's

[5] James Sellars, "James Sellars Bio," Hog River Music, http://www.hogriver.com/Sellars_Bio.html (accessed 29 September 2010).

[6] William Duckworth, "Bio," William Duckworth, http://www.billduckworth.com/bio (accessed 29 September 2010).

honors include four NEA and NEH fellowships, the 2001 ASCAP-Deems Taylor Internet Award, the 2002 Award in Music from the Foundation for Contemporary Arts, and a Senior Fulbright Specialist Award in Information Technology to Australia in 2007. He was also a Master Artist at the Atlantic Center for the Arts in 2006, as well as the 2007 Inaugural Creative Arts Fellow for South Bank Precinct, Brisbane.

APPENDIX B

MAJOR INSTANCES OF EACH THEME IN *AN HOUR FOR PIANO*

Only the starting places for each theme are listed below due to the ambiguity of transitional sections. These measure placements and durations should be considered approximate, and different interpretations are certainly possible.

Table 1 – Major Instances of Each Theme in *An Hour for Piano*

Starting Measure	**Theme**	**Number of Beats**	**Duration**	**Start Time**
1	1	184	03:06.41	00:00.00
47	T	73	01:13.96	03:06.41
65	2	68	01:08.89	04:20.36
81	T	94	01:35.23	05:29.25
100	4 (incomplete)	86	01:27.13	07:04.48
121	3	108	01:49.41	08:31.61
148	4	232.5	03:55.54	10:21.02
206	T	68	01:08.89	14:16.56
223	2/3 (combined)	72	01:12.94	15:25.45
241	3	104	01:45.36	16:38.40
267	T	60	01:00.79	18:23.76
282	5	175	02:57.29	19:24.54
325	6	144	02:25.88	22:21.83
361	4	146.5	02:28.42	24:47.72

Table continued on next page.

Table 1 – Continued

Starting Measure	Theme	Number of Beats	Duration	Start Time
398	T	58	00:58.76	27:16.13
412	2	90	01:31.18	28:14.89
433	T	83	01:24.09	29:46.07
454	6	254.5	04:17.83	31:10.16
518	T/2 (combined)	44.5	00:45.08	35:27.99
529	1	154	02:36.02	36:13.07
567	5	160	02:42.09	38:49.08
603	4	116.5	01:58.02	41:31.18
632	T	124	02:05.62	43:29.20
663	3	246	04:09.22	45:34.82
723	1	116	01:57.52	49:44.04
752	2	144	02:25.88	51:41.56
784	3/6 (combined)	44	00:44.58	54:07.45
795	6	164	02:46.15	54:52.02
836	5	140	02:21.83	57:38.17

APPENDIX C

PROGRAM NOTES FOR *AN HOUR FOR PIANO*

Program Notes[7]

To be read while hearing

AN HOUR FOR PIANO

by Tom Johnson

It is important that you try not to allow the program notes to distract you from concentrating on the music. They are intended to increase your ability to concentrate on the piece, and not to distract from it. If you find that reading the program notes does not increase your ability to concentrate on the music, you should not read further at this time. Perhaps, at some later time, you will find that reading the program notes will increase your ability to concentrate on the music.

Perhaps you are not sure whether the program notes are helping you to concentrate on the music or not. In order to determine whether they are helping you, you may wish to stop at the end of this paragraph, and see how clearly you can recall the music which you heard while you were reading the paragraph. If you can remember the music clearly, then perhaps the program notes are increasing your ability to concentrate on the music. If you can not

[7] Taken from Tom Johnson, *An Hour for Piano* (Paris: Editions 75, 1974), i-v. Reprinted with permission, Tom Johnson, Editions 75.

remember the music clearly, it is probably because reading the program notes has been distracting you from listening to the music. If they have been distracting you, you should not read further at this time. Perhaps, at some later time, you will find that reading the program notes will increase your ability to concentrate on the music.

This paragraph occurs several times in the program notes. However, it will probably seem different each time, because you will be listening to different music each time. You may find it interesting to compare the effect that the paragraph has when it is read in different musical contexts. Perhaps you will find that sometimes this paragraph increases your ability to concentrate on the music and sometimes it does not. Perhaps it will be more helpful to you on first reading than in later readings. Or perhaps the reverse is true.

You may find it interesting to consider that the form of the piece is determined to a large extent by you, since you are free to read or not read the program notes at any time. If you read the program notes very quickly and do not look at them again, you will hear the piece in one way. If you read very slowly, thinking and listening as you read each sentence, you will hear the piece in a very different way. If you alternate between reading and not reading, you will hear the piece in another way. Many other patterns might be followed. Probably no two people would follow the same pattern. You may find it interesting to consider the pattern you have been following up to this point. Perhaps you will want to continue following the same pattern. Or perhaps you will want to change the pattern.

Perhaps you will find that some sections in the program notes increase your ability to concentrate on the music more than other sections. Perhaps you will find that the program notes increase your ability to concentrate on some sections of the music more than on others.

Perhaps you will find that certain sections in the program notes are particularly helpful when read in conjunction with certain sections in the music. Perhaps you will find that the program notes increase your ability to concentrate on the music more when the music is rather constant than when it is changing. Or perhaps the reverse is true. Or perhaps the program notes are about equally helpful, regardless of whether the music is rather constant or whether it is changing. Perhaps you will find that certain sections in the program notes are not at all helpful, when read in conjunction with certain sections in the music.

If reading the program notes is not helping you to concentrate on the music, perhaps you should consider the possibility that you are reading too quickly or too slowly. Perhaps if you read the program notes more quickly or more slowly, they will be more helpful to you in increasing your ability to concentrate on the music. You may also wish to consider that the program notes may be more helpful to you if you do not read them continuously, but in sections. Perhaps if you stop reading from time to time, and listen to the music by itself for a while, you will find that the program notes will be more helpful to you when you return to them. You may also want to consider the length of the piece. The program notes are also rather long, but if you read them at a normal pace you will finish them long before you finish hearing the music. But if you read slowly, or if you stop from time to time, you may finish reading them about the same time the music finishes. You may find that the program notes do not increase your ability to concentrate on the music, regardless of how you read them. In that case, you should not read further at this time. Perhaps, at some later time, you will find that reading the program notes will increase your ability to concentrate on the music.

The music you are now hearing is probably very similar to some section you will hear later. You may find that it is more interesting to you now than it will be later. Or perhaps you will find that it will be more interesting later than it is now.

This paragraph occurs several times in the program notes. However, it will probably seem different each time, because you will be listening to different music each time. You may find it interesting to compare the effect that the paragraph has when it is read in different musical contexts. Perhaps you will find that sometimes this paragraph increases your ability to concentrate on the music and sometimes it does not. Perhaps it will be more helpful to you on first reading than in later readings. Or perhaps the reverse is true.

If you have been reading continuously up to this point, perhaps you should put the program notes down and listen to the music by itself for a while. If you have already done this, you may want to do it again. Perhaps you will find that you are able to concentrate on the music better when you are not trying to read at the same time. Perhaps you will find that you are able to concentrate on the music better when you are reading the program notes.

You may find it interesting to consider how many types of music you have already heard, or will hear. You may also find it interesting to consider how many different topics have been or will be discussed in the program notes. Some people might feel that there are only three different types of things in the music and eight or nine different types of things in the program notes. Some people might feel that there are eight or nine different types of things in the music and only a few different types of things in the program notes. Some people might count the different types of things very differently. Some people will probably

have no interest in counting the number of different types of things in the music and in the program notes.

From time to time, you should ask yourself whether or not the program notes have been distracting you from the music. It is important that you try not to allow the program notes to distract you from concentrating on the music, as they are intended to increase your ability to concentrate on the music, and not to distract from it. If you find that attempting to read and listen at the same time is too difficult or too restricting, you should not read further at this time. Perhaps, at some later time, you will find that reading the program notes will increase your ability to concentrate on the music. If you find that the program notes are always distracting and never increase your ability to concentrate on the music, perhaps you will want to forget all about the program notes and never read any further. Or perhaps you will want to forget all about both the program notes and the music, and think about something completely unrelated to either. You may find it interesting to notice what sorts of thoughts cross your mind.

If the music you are now hearing is rather constant, you may find it interesting to consider when it will change. If the music you are now hearing seems to be changing, you may find it interesting to consider when it will begin to sound rather constant again. Perhaps you feel that the music is always rather constant. Or perhaps you feel that the music is always changing. Some people will probably have no interest in making such comparisons.

You may find that the music is distracting you from the program notes, and that you are not comprehending all the ideas you are reading. That is not important, since the program notes are intended to increase your ability to concentrate on the music and are not that

important in themselves. But if you find that the program notes are distracting you from the music, you should not read further at this time. Perhaps, at some later time, you will find that reading the program notes will increase your ability to concentrate on the music.

The music you are now hearing is probably very similar to some section you will hear later. It may also be very similar to some section you have already heard. You may find that it is more interesting to you now than it will be later or than it was before. Perhaps it is less interesting to you now than it was or will be at some other time.

If the program notes are distracting you from the music, it may be because you are reading too slowly or too quickly. Perhaps, if you read more slowly or more quickly, the program notes will increase your ability to concentrate on the music. You may also wish to consider the length of the piece. You should be able to estimate roughly how long it will take you to finish reading them at your present rate, and about how much music will be left after you finish the program notes. Since you will probably not feel like rereading any of the program notes, you may wish to pace yourself so that you finish reading them about the same time the music finishes. Or perhaps you will want to finish the program notes and then listen to the music by itself. It is important to remember that the form of the piece is determined to a large extent by you.

This paragraph occurs several times in the program notes. However, it will probably seem different each time, because you will be listening to different music each time. You may find it interesting to compare the effect that the paragraph has when it is read in different musical contexts. Perhaps you will find that sometimes this paragraph increases your ability

to concentrate on the music and sometimes it does not. Perhaps it will be more helpful to you on first reading than in later readings. Or perhaps the reverse is true.

Perhaps you will find that some sections in the program notes distract you from listening to the music more than other sections. You may find it interesting to consider which sections are the most distracting. Perhaps you will find that some sections in the music interest you more than other sections, regardless of what you may be reading in the program notes. You may find it interesting to consider which sections these are. Perhaps you concentrate on the music more when it is rather constant than when it is changing. Or perhaps the reverse is true. Perhaps you feel that the music is always rather constant. Perhaps you feel that the music is always changing. Some people will probably have no interest in making such comparisons.

It is important to remember that the program notes are intended to increase your ability to concentrate on the music, and not to distract from it. If you find it too difficult or too restricting to read and listen at the same time, you should not read further at this time. Perhaps, at some later time, you will find that reading the program notes will increase your ability to concentrate on the music.

If you are not sure whether the program notes are helping you to concentrate on the music or not, you may wish to stop at the end of this paragraph, and see how clearly you can remember the music which you heard while you were reading the paragraph. Since this same procedure was suggested earlier in the program notes, you may find it interesting to compare your ability to remember the music now with your ability to remember the music then. Perhaps you will be able to remember the music which goes with this paragraph better than

you were able to remember the music which went with that earlier paragraph. Perhaps you were able to remember the music better when you read the earlier paragraph.

If you have been reading continuously up to this point, you should consider putting the program notes down and listening to the music by itself for a while. Perhaps you will find that you are better able to concentrate on the music when you are not attempting to read the program notes at the same time. Perhaps you will find that the program notes were increasing your ability to concentrate on the music, and that you will not be able to concentrate on the music as well when you are not reading the program notes. If you are able to concentrate on the music better when you are not reading the program notes, you should not read further at this time. Perhaps, at some later time, you will find that reading the program notes will increase your ability to concentrate on the music. If you find that the program notes are always distracting, you may not want to read the remaining paragraphs at all.

It is important to remember that the form of the piece is determined to a large extent by you, since you are free to read or not read the program notes at any time. If you have been alternating between reading and not reading, you have been hearing the piece in one way. If you have been reading continuously up to this point, you have been hearing the piece in another way. If you are now reading more quickly or more slowly than when you began, that too would affect the way you have been hearing the piece. Perhaps you will want to continue reading the program notes in the same way. Or perhaps you will want to change the pattern.

The following paragraph has already occurred in the program notes three times. Perhaps the idea of reading it a fourth time will not appeal to you. If so, you may want to read it very quickly this time. Or perhaps you will want to skip it entirely. But if the idea of

reading it a fourth time does not seem too difficult or too restricting, you may want to read it again in much the same way you read it before. Perhaps, since you are now very familiar with it, you will find that it does not distract you from the music as much as it did before. Or perhaps you will find that it is more distracting than before. You may also find that it is more difficult to comprehend and relate to than it was when you read it before.

This paragraph occurs several times in the program notes. However, it will probably seem different each time, because you will be listening to different music each time. You may find it interesting to compare the effect that the paragraph has when it is read in different musical contexts. Perhaps you will find that sometimes this paragraph increases your ability to concentrate on the music and sometimes it does not. Perhaps it will be more helpful to you on first reading than in later readings. Or perhaps the reverse is true.

Now that you are approaching the end of the program notes, you may want to consider the length of the piece. You should be able to estimate roughly how long it will take you to finish reading the program notes at your present rate, and about how much music will be left after you finish reading them. Since you are free to read or not read the program notes at any time, the form of the piece is determined to a large extent by you. Perhaps you will want to stop reading at this point, and return to the remaining paragraphs when you think the piece is about to finish. Perhaps you will want to continue reading at your present rate. Or perhaps you will want to read the remaining paragraphs more slowly or more quickly. How you experience the last part of the piece will be determined partly by the pattern you choose for reading the last part of the program notes.

The music you are hearing now is probably very similar to some section you heard earlier. You may find that it is more interesting to you now than it was before. Or perhaps it was more interesting to you then than it is now.

In order to determine whether the program notes have been increasing your ability to concentrate on the music, you may find it interesting to see how clearly you can remember all the music you have heard up to this point, and how clearly you can remember all the program notes you have read up to this point. If you can remember the music more clearly than you can remember the program notes, the program notes have probably been helping you to concentrate on the music. If you can remember what you have read more clearly than you can remember what you have heard, the program notes have probably been distracting you from the music, and you should not read further at this time. Perhaps, at some later time, you will find that reading the program notes will increase your ability to concentrate on the music.

When you finish reading the program notes, you may wish to consider how much of the piece remains to be played, and how you will want to listen to the music once you have finished the program notes. If the program notes have increased your ability to concentrate on the music you may want to reread parts of them. Perhaps, if you do reread parts of them, they will continue to increase your ability to concentrate on the music. Probably you will not feel like rereading the program notes, and will want to put them down and listen to the music by itself. Perhaps you will find that you will be able to concentrate on the music better after you have finished reading the program notes. Or perhaps you will find that you will continue to think about the program notes, even though you have finished reading them. Or perhaps

you will want to think about something completely unrelated to either the music or the program notes. You may find it interesting to notice what sorts of thoughts cross your mind.

APPENDIX D

ANALYSIS OF THE RHYTHMIC GROUND IN THE *TIME CURVE PRELUDES, IX*

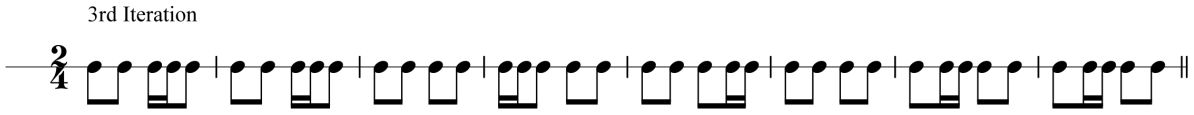
There are five basic rhythmic patterns for the rhythmic ground, each one measure in length as seen here:

The following matrix then emerges when each iteration of the ground is layered on top of one another. The numbers with asterisks show where the repeated Gs, which terminate the theme of the right hand, fall.

Table 2 – Iterations of the Rhythmic Ground in *Time Curve Preludes, IX*

	Measure #1	Measure #2	Measure #3	Measure #4	Measure #5	Measure #6	Measure #7	Measure #8
1)	3	3	0	1	4	0	2	0*
2)	3	3	0	1	4	0	0*	2
3)	3	3	0	1	4	0*	2	2
4)	3	3	0	1	0*	0	2	2
5)	3	3	0	0*	4	0	2	2
6)	3	0*	0*	1	4	0	2	2
7)	0*	3	0	1	4	0	0*	2
8)	3	3	0	1	0*	0	2	2
9)	3	0*	0*	1	4	0	2	0*
10)	3	3	0	1	0*	0	2	2
11)	3	0*	0	1	4	0	0*	2
12)	3	3	0	0*	4	0	2	2*
13)	3	3	0	1*	-			

Several observations can be made from this matrix. First, in iterations 6 and 9 the two G's span two measures. Second, as the theme becomes gradually shorter, its relationship to the ground becomes less aurally recognizable. Third, the only instances where the Gs are not represented by 0 are at the end of 12, the end of the left hand theme, and at the conclusion of the piece. Finally, the only iteration that is not rhythmically disrupted by the repeated Gs is number 3, and thus is the most pure representation of the ground.



APPENDIX E

FURTHER ANALYSIS OF PAUL EPSTEIN'S *INTERLEAVINGS*,

"PARAPHASE: (3x2)x5, 7"

Let A equal the 2-note cell, then A1 = F# and A2 = C#

Let B equal the 3-note cell, then B1 = E, B2 = B, and B3 = D.

Let C equal the 5-note cell, then C1 = C#, C2 = F#, C3 = E/A, C4 = G#, and C5 = E/B Where X/Y represents a harmonic interval with X above Y

Let D equal the 7-note cell, then D1 = C#, D2 = F#, D3 = E/A, D4 = G#, D5 = E/B, and D6 and D7 both equal rests[8]

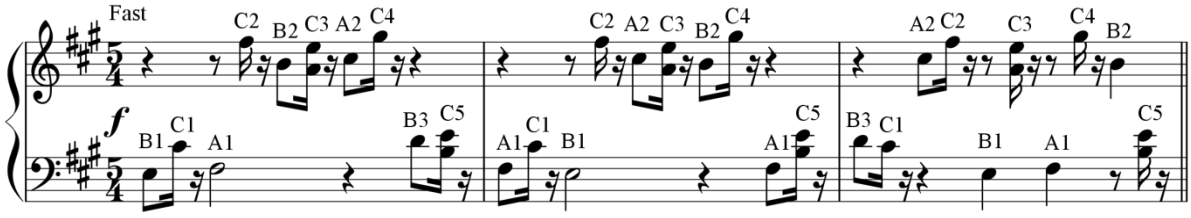
Let each note, A1 through D5 represent a single pitch and not the entire pitch class, and letting each note of the following patterns fall on each eighth note of a measure, then the measure 1 is:

B1 C1 A1 C2 B2 C3 A2 C4 B3 C5

And Section 1, measures 1-12, is defined as continuing this pattern where A and B alternate being positioned between notes of C and all cells continue in sequential order until measure 12.

[8] The notes of each cell were provided by Paul Epstein, "postminimalist piano pieces.3," Personal email (25 August 2007). The following analysis is the author's.

Example D.1, *Interleavings*, "Paraphase (3x2)x5, 7," measures 1-3. Score excerpt printed with permission, Paul Epstein.



Rhythmically, Section 1 abides by the following rules:

First, all notes of C are represented by a sixteenth-note and sixteenth-rest

All other notes of A and B are eighth notes, save when the following C-note is in the hand opposite of the one that played A or B, then the duration is of a quarter note. (The first two instances of hand change, measures 1-2, are represented by half notes to accommodate the relatively long space without a change of hands that follows.

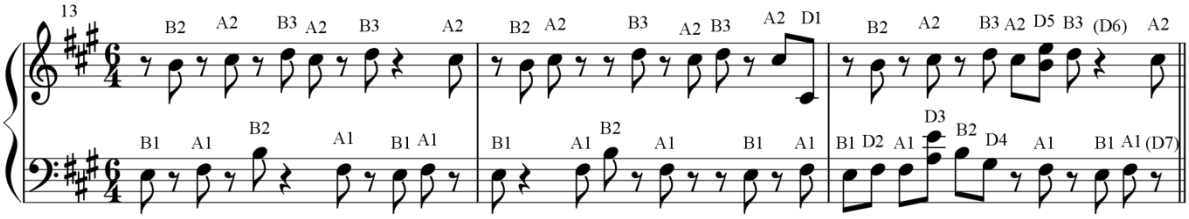
Section 2, measures 13-30, is defined by the base pattern of measure 13:

B1 B2 A1 A2 B2 B3 A2 A1 B3 B1 A1 A2

That is, two notes of B are alternated with two notes of A, with each note of the cell repeated twice excepting the initial notes of both B and A, which proceed immediately to the subsequent note of their respective cells.

On top of this base pattern, two additional patterns are added. The first is cell D, which enters on the last note of measure 14 and continues sequentially, D1 through D7, with an eighth-note rest between each note.

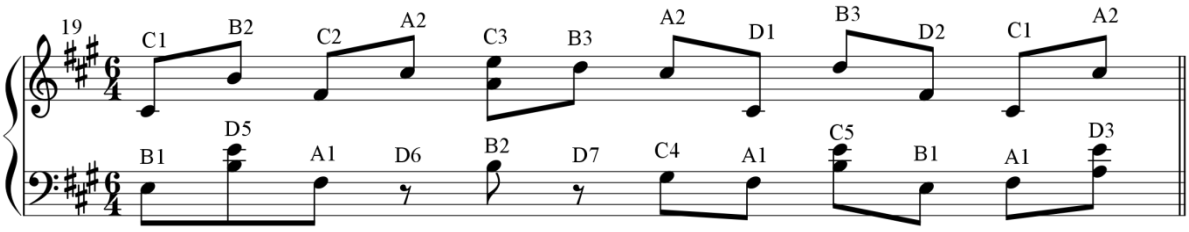
Example D.2, *Interleavings*, "Paraphase (3x2)x5, 7," measures 13-15. Score excerpt printed with permission, Paul Epstein.



The second pattern is cell C, which enters on the downbeat of measure 19 and continues sequentially, C1 through C5, with an eighth-note rest between each note.

Thus, the first measure in which all patterns are present, measure 19, is as follows.

Example D.3, *Interleavings*, "Paraphase (3x2)x5, 7," measures 19. Score excerpt printed with permission, Paul Epstein.



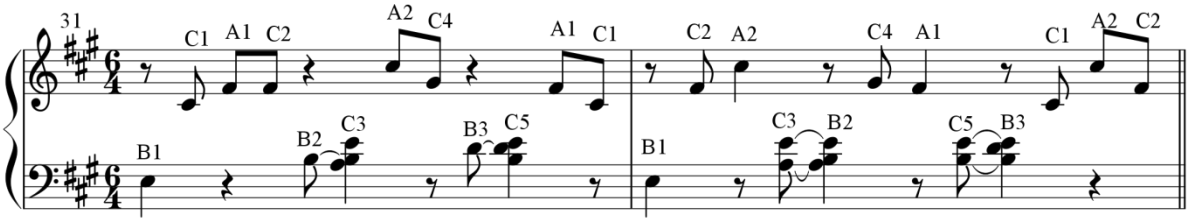
This pattern continues measure 28, where the C and D patterns end together and then drop out. Measures 29 and 30 are then the same interspersing of A and B that was seen in measures 13-14.

Rhythmically, all notes in Section 2 are represented by eighth notes.

Section 3, measures 31-40, follows the same pattern as Section 1, with two

alterations. First, the specific pitches of each note of the cell may have changed, and second, certain notes are tied to the following notes. The notes that are always tied are C3 and C5, though the alternate is that they are tied to the preceding note and the following note. That is, the first instance of C3 and C5 will have them being tied to the previous note and the next instance of C3 and C5 will have them tied to the following notes, etc.

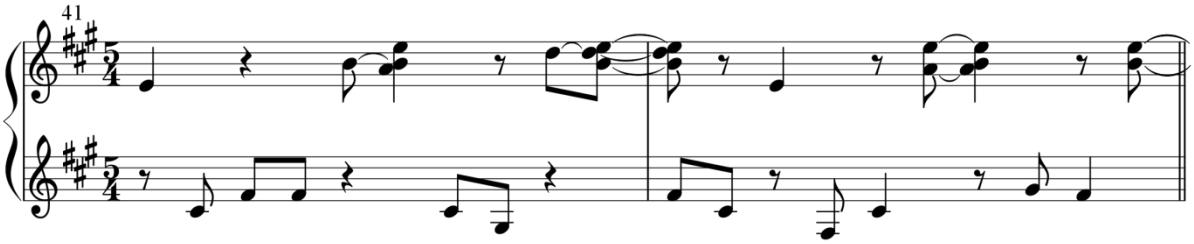
Example D.4, *Interleavings*, "Paraphase (3x2)x5, 7," measures 31-32. Score excerpt printed with permission, Paul Epstein.



Rhythmically, all notes are represented as eighth notes, with the same quarter-note rule as was in Section 1.

Section 4, measures 41-52, is virtually identical to Section 3, with the exception of hand inversion and meter change. The material that had previously been in the left hand is now played an octave higher and in the right hand, and vice versa, though not all notes that had been in the right hand have an octave displacement when switched to the left. The rhythmic rules and pattern of ties continues as in Section 3.

Example D.5, *Interleavings*, "Paraphase (3x2)x5, 7," measures 41-42. Score excerpt printed with permission, Paul Epstein.



APPENDIX F

INTERVIEW WITH DAVID BORDEN

In the process of researching this topic, I had the opportunity to interview several postminimalist composers. I have chosen to include my interview with David Borden in its entirety, as it is remarkably creative, insightful, and too valuable to summarize. Note that while the questions are my own, their order and repetition are a part of his response.[9]

First of all, thank you for your inquiry because it gave me the opportunity to verbalize some of the thought processes which got me to this point in my composing.

1. What is your opinion of the term postminimalist and its application to your work?

During their active careers, both Ted Williams and Joe DiMaggio were valued for their ability to drive in runs (RBI totals) and hit home runs. They were called home run hitters. However, they are remembered quite differently: Williams is remembered as the last man to bat over .400 and DiMaggio for his 56-game hitting streak.

2. What is your opinion of the term postminimalist and its application to your work?

[9] The following is quoted from David Borden, "Re: Research Project," Personal email, 14 November 2007.

In 1970 when I finally made my first drone-like piece with repetitive phrases and a steady pulse but with constantly changing meters (Easter), it was a due to several influences: Terry Riley's In C, my intense jazz background, and my own attempts at returning to tonality after several years of serial and atonal works reflecting the intellectual/artistic academic pressure of the late fifties and early sixties. George Rochberg was doing it, but in a way that I intuitively thought was severely misdirected although I didn't know why.

I am giving you this background because when you use certain terms for what have become accepted labels and genres, assumptions are being made which I do not share or necessarily accept.

3. Do you feel like your music is projected forward through time or more present-oriented (or both)?

Milton Babbitt is pitching for the Uptowners. The Downtowners are up to bat. Stepping into the batting box is John Cage. He looks on edge because he never likes being confined to the box although he loves hitting the curve and fast-ball. Babbitt has a limited repertoire of pitches he can throw, but one can't be sure of the preferred sequence until after the first time through the order. Cage steps in and out of the box quite often, even during the wind-ups, calling time. The pitcher, frustrated, eventually walks him. The next batter is Bob Ashley an unpredictable batter who hits to all fields. After letting two strikes go by, he hits a grounder that bounces so crazily none of the infielders can reach it. However, due to the unpredictability of the spin, it eventually bounces back toward the first base line and hits Ashley as he's running to first. He's called out, but the first base coach, Harry Partch,

congratulates him on advancing the runner to second. Stepping into the batting box next is Morton Feldman, the burly looking guy from Queens. He takes a couple of balls out of the zone, always smiling. He takes what seems like forever between pitches, stepping out of the box after each delivery, fiddling with his gloves, helmet, and glasses. This, combined with Cage constantly moving around and jumping--taking long strides toward third causes the pitcher to commit a balk. Cage is awarded third base. Feldman takes the next pitch for a called strike, giving the umpire a dirty look. He swings at the next one, connecting for a soft line drive, fairly deep, into left field. It's caught at a very awkward angle, allowing Cage to score from third. The next batter is Lamont Young who hits a sky-high pop-up. The shortstop, John Rockwell, misjudges it and it drops in for a single. Next up is Terry Riley who check swings a little dribbler to third which turns into an infield hit. There are runners on first and second. Up to the plate steps Steve Reich, an extremely methodical and effective hitter. Sensing a dangerous situation, the Uptowners walk him intentionally. Philip Glass, who's having a great season, steps up to the plate. The team on the field taunts him, showing no respect. However, the crowd loves him and rises to its feet. Glass fouls off several pitches in a row, with the crowd egging him on. Finally, he connects with a curve ball, lifting it over the center field bleachers for a tremendous grand slam home run. The Downtowners are up five to nothing. With John Zorn on deck, this proves Babbitt's undoing as he is taken out of the game for a reliever. However, the Downtowners go on to win.

4. Do you feel like your music is projected forward through time or more present-oriented (or both)?

It depends on the piece. It depends on the way one listens to the piece. It depends on the way the piece is played. It depends on where the piece is played. It depends on whether the piece is played before or after intermission. It depends on the piece being played at all. Double Portrait is not performed that often any more since Double Edge recorded it for CRI many years ago. Casablanca. As time goes by. I dunno. Time is money.

5. What is your opinion of the term postminimalist and its application to your work?

When you ask about 'postminimalist' and 'minimalist' influences in my music, I must tell you that I don't think in those terms, ever. I've noticed that when "ism" and "ist" become suffixes to creative endeavors they tend to institutionalize qualities found in various individuals' works of art, music and writing thus robbing them of their unique identities.

6. What elements of your music cause you to say that?

The notes. The rhythms. The meters. The timbres. The number of players involved. The length of the piece(s). The instruments used.

7. Do you feel like your music is projected forward through time or more present-oriented (or both)?

In 1964-65 Jonathan Kramer was a senior at Harvard, and in Leon Kirchner's composition seminar. I was also a member as were the Tcherepnin brothers Serge and Ivan and Tison Street. There were a few others, but I don't remember their names. After every meeting was over, Jonathan remained in the hall outside for several minutes looking

befuddled and frustrated. I think he had trouble putting together, in his mind, all of the music and ideas discussed in the seminar. Many years later I assisted in his visit to Cornell. He seemed confident, and had obviously spent a lot of time sorting things out and codifying many aspects of contemporary music. He seemed satisfied. It was me who still wondered what the hell was going on.

8. Do you feel like your music is projected forward through time or more present-oriented (or both)?

If you go to [mothermallard.com] *and download any of the K216 pieces, I think you might agree that it goes both forward and backward at the same time. Or not.*

9. What is your opinion of the term postminimalist and its application to your work?

I'm not a theorist or musicologist or journalist. I am a composer and keyboard player. It means nothing to me.

10. What elements of your music cause you to say that?

Can you repeat that please?

BIBLIOGRAPHY

Adams, John. "The Machine in the Garden." John Adams: Interviews, Articles, Essays. http://earbox.com/inter-machine.html (accessed 5 Dec 2007).

Anderson, Beth. *Net Work*. Self published, 1984.

Anderson, Beth. "Beth Anderson, Composer." http://www.beand.com/ (accessed 29 September 2010).

Aristotle. *Aristotle's Metaphysics*. Translated by John Warrington. Alcester: Read books, 2007.

Bernard, Jonathan A. "Minimalism, Postminimalism, and the Resurgence of Tonality in Recent American Music." *American Music* 21, no. 1 (Spring 2003): 112-133.

_____. "Theory, Analysis, and the 'Problem' of Minimal Music," In *Concert Music, Rock, and Jazz Since 1945: Essays and Analytical Studies*, ed. Elizabeth West Marvin and Richard Hermann, 259-284. Rochester: University of Rochester Press, 1995.

_____. "The Minimalist Aesthetic in the Plastic Arts and in Music." *Perspectives of New Music* 31, no. 1 (Winter, 1993): 86-132.

Borden, David. "About David Borden." Mother Mallad. http://web.mac.com/rebeccagodin/David/David_Borden.html (accessed 29 September 2010).

_____. "Re: Research Project." Personal email, 14 November 2007.

_____. *Double Portrait*. Ithaca, NY: Lameduck Music, 1987.

Broad, Elaine. "A New X? An Examination of the Aesthetic Foundations of Early Minimalism." *Music Research Forum* 5 (1990): 51-62.

Cervo, Dimitri. "Post-minimalism: A Valid Terminology?" *Ictus* 1 (Dec 1999): 37-51.

Christensen, Erik. *The Musical Timespace: A Theory of Listening*, Vol. I. Aalborg: Aalborg University Press, 1996.

Cohn, Richard. "Transpositional Combination of Beat-Class Sets in Steve Reich's Phase-Shifting Music." *Perspectives of New Music* 30, no. 2 (1992): 146-177

Decroupet, Pascal. "Logic and Permutation in the Music of Tom Johnson." In *The Ratio Book: A Documentaiton of* The Ratio Symposium, *Royal Conservatory, The Hague, 14-16 December 1992*, ed. Clarence Barlow, 116-125. Köln, Germany: Feedback Studio, 2001.

Denbigh, K. G. "In Defense of *the* Direction of Time." in *The Study of Time*, ed. J. T. Fraser, F. C. Haber and G. H. Müller, 148-158. New York: Springer-Verlag, 1972.

Duckworth, William. "Bio," William Duckworth. http://www.billduckworth.com/bio (accessed 29 September 2010).

_____. "Re: Research Project," Personal email (29 January 2008).

_____. *Time Curve Preludes, IX*. New York: C. F. Peters, 1979.

Epstein, David. *Shaping Time*. New York: Schirmer Books, 1995.

Epstein, Paul. "Paul A. Epstein." *Society of Composers*. http://www.societyofcomposers.org/user/paulepstein.html (accessed 29 September 2010).

_____. "Re: Postminimalist Piano Pieces.1." Personal email, 8 November 2007.

_____. *Interleavings*. Richfield, NC: Gold Branch Music, Inc., 2002.

_____. "Pattern Structure and Process in Steve Reich's *Piano Phase*." *The Musical Quarterly* 72, no. 4 (1986): 494-502.

Fink, Robert. *Repeating Ourselves: American Minimal Music as Cultural Practice*. Los Angeles: University of California Press, Ltd., 2005.

Flaherty, Michael G. *A Watched Pot: How We Experience Time*. New York: New York University Press, 1999.

Frank, Walter. "The Piano Music of William Duckworth." M.A. thesis, Wesleyan University, 2005.

Fraser, J. T. *Of Time, Passion, and Knowledge*. Princeton: Princeton University Press, 1975.

Gann, Kyle. "Postminimalism: Chapter One, Metaphorically Speaking." PostClassic. Entry posted 28 May 2007. http://artsjournal.com/postclassic/2007/05/postminimalism_chapter_one_met.html (accessed 2 August 2010).

_____. "Metametrics, Postminimalist Version." PostClassic. Entry posted 19 February 2006. http://artsjournal.com/postclassic/2006/02/metametrics_postminimalist_ver.html (accessed 2 Aug 2010)

_____. "Sixty Minutes to Change Your Life." PostClassic, 23 April 2004. http://www.artsjournal.com/postclassic/2004/04/sixty_minutes_to_change_your_l.html (accessed 25 June 2010).

_____. "Minimal Music, Maximal Impact." New Music Box, 1 November 2001. http://www.newmusicbox.org/page.nmbx?id=31tp05 (accessed 1 August 2010).

_____. "Discography of Postminimal, Totalist, and Rare Minimalist Music." http://www.kylegann.com/postminimaldisc.html (accessed 1 Aug 2010).

Garland, Peter. *Jornada Del Muerto.* Lebanon, NH: Petroglyph Music, 1987.

_____. "Peter Garland." New Albion Records. http://www.newalbion.com/artists/garlandp/ (accessed 29 September 2010).

Glass, Philip. *Two Pages*. Dunvagen Music Publ., Inc., 1968.

Johnson, Timothy. "Minimalism: Aesthetic, Style, or Technqiue." *The Musical Quarterly* 78, no. 4 (Winter, 1994): 742-773.

Johnson, Tom. "Re: An Hour for Piano." Personal email, 16 June 2010.

_____. "La Monte Young, Steve Reich, Terry Riley, and Philip Glass." In *The Voice of New Music*. Eindhoven: Apollohuis, 1989. [PDF version online] http://www.editions75.com/Books/TheVoiceOfNewMusic.PDF (accessed 19 May 2010).

_____. "Shredding the Carrot Climax." In *The Voice of New Music*. Eindhoven: Apollohuis, 1989. [PDF version online] http://www.editions75.com/Books/TheVoiceOfNewMusic.PDF (accessed 19 May 2010).

_____. "The Years of Innovation Pass On." In *The Voice of New Music* (Eindhoven: Apollohuis, 1989). [PDF version online] http://www.editions75.com/Books/TheVoiceOfNewMusic.PDF (19 May 2010).

_____. *An Hour for Piano*. Paris: Editions 75, 1971.

Klein, Stefan. *The Secret Pulse of Time*. Translated by Shelly Frisch. New York: Marlowe and Co., 2006.

Kramer, Jonathan. *The Time of Music*. New York: Schirmer Books, 1988.

Marsden, Alan. *Representing Musical Time: A Temporal-Logical Approach*. Lisse: Swets & Zeitlinger, 2000.

Mertens, Wim. *American Minimal Music*. New York: Alexander Broude, Inc, 1983.

Meyer, Leonard. *Music, the Arts, and Ideas: Patterns and Predictions in Twentieth-Century Culture.* Chicago: University of Chicago Press, 1967, 1994.

Mozart, W. A. *Sonata in A Major, K 331*. Leipzig: Breitkopf & Härtel, 1877-1910.

Nyman, Michael. *Experimental Music: Cage and Beyond*. New York: Schirmer, 1974.

Page, Tim. "Dialogue With Philip Glass and Steve Reich (1980)." *Writings on Glass*. New York: Schirmer Books, 1997.

Pasler, Jann. "Narrative and Narrativity in Music." In *Time and Mind: Interdisciplinary Issues*, ed. J. T. Fraser, Madison, 233-257. CT: International Universities Press, Inc, 1989.

Potter, Keith. *Four Musical Minimalists.* Cambridge: Cambridge University Press, 2000.

Quinn, Ian. "Minimal Challenges: Process Music and the Uses of Formalist Analysis." *Contemporary Music Review* 25, no. 3 (June 2006): 283-294.

Reich, Steve. "Early Works (1965-68)." In *Writings on Music: 1965-2000*, ed. Paul Hillier, 22. New York: Oxford University Press, 2002.

_____. "Music as Gradual Process." In *Writings on Music: 1965-2000*, ed. Paul Hillier, 34. New York: Oxford University Press, 2002.

_____. "Piano Phase." In *Writings on Music: 1965-2000*, ed. Paul Hillier, 22-24. New York: Oxford University Press, 2002.

Riley, Terry. *Keyboard Study no. 1.* Self published, c. 2002.

Rochberg, George. "The Structure of Time in Music: Traditional and Contemporary Ramifications and Consequences." In *The Study of Time II*, ed. J.T. Fraser and N. Lawrence, 136-149. New York: Springer-Verlag, 1975.

Rockwell, John. "Review/Music; A Composer's 12-Part Story of Counterpoint." *New York Times*, 8 April 1990. http://www.nytimes.com/1990/04/08/arts/review-music-a-composer-s-12-part-story-of-counterpoint.html (accessed 9 August 2010).

Roeder, John. "Beat-Class Modulation in Steve Reich's Music." *Music Theory Spectrum* 25, no. 2 (Autumn, 2003): 275-304.

Saltini, Roberto Antonio. "Structural Levels and Choice of Beat-Class Sets in Steve Reich's Phase-Shifting Music." *Intégral* 7 (1993): 149-178

Sellars, James. *Sonatina*. Hartford: Hog River Music, 1988.

Sellars, James. "James Sellars Bio." Hog River Music. http://www.hogriver.com/Sellars_Bio.html (accessed 29 September 2010).

Sellars, James. *Sonata No. 6 (Patterns on a Field)*. Hartford: Hog River Music, 1986.

Silverman, Adam B. "Stylistic Combination and Methodical Construction in William Duckworth's *Southern Harmony*." *Contemporary Music Review* 20 (2001): 45-59.

Slife, Brent D. *Time and Psychological Explanation*. Albany: State University of New York Press, 1993.

Solomon, John. "The Six Piano Sonatas of James Sellars: Aspects of Form, Rhythm, Texture, and Style." D.M.A. diss., University of North Texas, 2003.

Strickland, Edward. *Minimalism: Origins*. Indianapolis: Indiana University Press, 1993.

Warburton, Dan. "Tom Johnson: Interview with Dan Warburton." Paris Transatlantic Magazine, March 2007. http://www.paristransatlantic.com/magazine/interviews/johnson.html (accessed 16 June 2010).

Xenakis, Iannis and Roberta Brown. "Concerning Time." Perspectives of New Music, Vol. 27, No. 1 (Winter, 1989): 84-92.

York, Wes. "Form and Process." In *Writings on Glass*, 60-79. New York: Schirmer Books, 1997.

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Mr. Lee is currently an Artist-in-Residence at Avila University where he coordinates the piano department. He has given numerous lecture-recitals across the country on the subject of minimalism, postminimalism, time, and performance issues, and most recently presented a paper at the Second International Conference for Minimalist Music. He has also released a commercial recording of Tom Johnson's *An Hour for Piano*, which is available on the Irritiable Hedgehog Music label (http://irritablehedgehog.com).