

TAKING REICH'S *PULSE*: PUTTING NEW MUSIC INTO CONTEXT

ANJA MILEUSNIC-PLECAS

Thesis submitted to the University of Ottawa
in partial Fulfillment of the requirements for the
Master of Arts (MA)

School of Music
Faculty of Arts
University of Ottawa

© Anja Mileusnic-Plecas, Ottawa, Canada, 2018

Table of Contents

Abstract	0
Taking Reich’s Pulse: Putting New Music into Context	1
Chapter 1: Style Separation	3
Style and Influence	5
First Period-Phasing and Early Style	9
Phasing, Gradual Processes, and Simple Instrumentation (1965-1973)	9
Beginnings of Texture, Expanded Instrumentation, and Harmony (1973-1979).....	13
Second Period-Development of Melody, Motives, Harmonic Structure, and Canons	16
Vocals, Speech Melodies, and Video (1981-2006).....	16
Counterpoint Series (1982-2003).....	20
Instrumental Compositions (1984-2005)	22
Third Period-Synthesis and External Genres (2006-present).....	26
Harmony and Canons.....	26
Tape Works	27
Arrangements.....	28
Melody and Rhythm	29
Chapter 2: Comparative Analysis of Pulse	32
Terminology Specification.....	36
Analysis	37
Melodic Development Within Movements	38
Canons and Chords	41
Phasing Returns?.....	44
The Emergence of an Arch Form through Melodic Treatment.....	51
Chapter 3: Formal and Instrumentation Analysis	57
Analysis	57
Cycles, Drones, and Melodic Treatment for the Creation of Form.....	58
Pulse and the Counterpoint Series	63
The Arch Form.....	65
ABCDCBA	67

Arch Form within an Arch Form	68
Conclusion	70
References.....	73
Appendices.....	76
Appendix A1	76
Appendix A2.....	77
Appendix A3.....	78
Appendix B	79
Appendix C	81
Appendix D.....	82
Appendix E	84
Appendix F.....	86
Appendix G.....	87
Appendix H.....	89
Appendix I	90
Appendix J	91

Abstract

Premiered on November 1st 2016, Steve Reich's new work *Pulse: For Winds, Strings, Piano and Electric Bass* epitomizes 51 years of compositional development. Understandably, no formal or analytical discussions exist of this work, a lacuna that inspires the present research questions: Where does *Pulse* fall in relation to Reich's overall style and technique? Is it a logical continuation of his compositional evolution? Does it make use of the techniques that distinguish him or does it venture into new territories? To answer these questions, the thesis combines a historical survey of Reich's compositional output with an analysis of *Pulse* that considers current analytic scholarship. An overview of the literature on the composer serves to determine the separate compositional periods of his output in relation to his most employed techniques. This amalgamation allows for a historically and stylistically contextualized analysis of *Pulse*. The resulting synthesis not only creates a new categorization of Reich's compositional development, but also shows that *Pulse* embodies a summation of the composer's musical technique.

Taking Reich's *Pulse*: Putting New Music into Context

Throughout his career, Steve Reich (b.,-1936) produced a large repertoire of pieces for solo instrument, ensemble, orchestra, voice, and electronic media. Across this varied compositional output, he used many techniques such as chord cycles, melodic construction through fragmentation, contrasting orchestral textures, and rhythmic transformations. The present thesis seeks to give an account of such techniques in his more recent piece, *Pulse*, for winds, strings, piano and electric bass (premiered November 1st 2016) by situating it in the context of his output. To that end, I analyze the work in relation to the composer's stylistic evolution. The literature provides relevant tools for studying a piece by establishing the most applicable techniques for analytic emphasis and by allowing the reader to find links as well as reoccurring procedures across the composer's output. Through an examination of the literature pertaining to a composer's career, one can also establish style periods. In the case of Reich, his large musical production seems to require separation into three compositional periods for a better understanding of his evolution as a composer. The present thesis is the first to attempt such a periodization of Reich's compositions. This first chapter creates an instructive compilation explaining Reich's techniques and progression in compositional direction. The goal of this reflection was to acquire a deeper understanding of the composer, his style, his compositional techniques, and how they evolved, by listening to Reich's entire repertoire and evaluating the content of each piece with the help of the scholarly literature. Also, deciphering *Pulse* requires understanding both the compositional techniques most common in Reich's music as well as the analytic methods employed by scholars. Stemming from this reflection, the second and third chapters attempt a score analysis of *Pulse*. This analysis focuses on comparing the treatment of melody, rhythm, form, cycles, and instrumentation to the composer's output through the perspective of the produced style periodization. Based on the

available literature, two questions arise: Can Reich's evolution as a composer be classified into separate periods of composition? Can we perceive and analyse *Pulse* as a logical continuation of his compositional development with the understanding of his stylistic evolution and his reoccurring techniques? Such a fusion of history and analysis suggests that *Pulse* is not only a combination and continuation of Reich's compositional process as pertaining to the progression of form, harmony, melody, and rhythm, but also exemplifies the consummation of Reich's evolution as a composer.

Chapter 1: Style Separation

If there is one thing that inspired the present thesis, it is the absence of the sense of style period division in Reich's compositional output. The overview of scholarly writings on Reich's works helps to grasp the vastness of the composer's techniques which in turn allows the reader to find links and reoccurring procedures in his style. The quoted scholars within this chapter present substantial historical and theoretical information that will facilitate a division of Reich's compositional output into style periods. The composer's writings on matters of performance and musical output also complement the research.

For example, Robert K. Schwarz and Marc Mathey are most informative regarding Reich's music until 2002. Schwarz describes Reich's style evolution chronologically through his life events, his influences, and his compositions. In *Minimalists* (1996), he covers Reich's beginnings and his musical output up until *The Cave* (1993) by offering both reflections on the techniques of the works and sheet music examples. I adopt a similar approach by combining information obtained by numerous scholars and conducting auditory analyses of his works to demonstrate how Reich evolved as a composer. Similarly, in *Music as a Gradual Process Part II* (1982), Schwarz expands on the different elements of *Six Pianos* and compares it to previous works, *Drumming* in particular, while enumerating and giving sheet music examples of the similar elements and the evolved techniques. The author treats following pieces, up until *Tehillim*, in the same manner. This inspired the way the present thesis covers the stylistic evolution, through technique description and progression, and the comparative reflections on previous repertoire adopted in the analysis section.

Mathey presents Reich's stylistic background while focusing on specific pieces and their musical elements. Since *Steve Reich: Un Art de L'Ambiguïté* (2004) is a much larger work than most of the cited sources, it is useful to separate it into three sections: style, analysis, and interviews. The first section offers information on specific elements that characterize each piece. The second is purely analytical. The third focuses on interviews, an alternative way of dealing with stylistic content. The present thesis reflects this approach as the first section describes Reich's musical technique and style, and the second analyzes Reich's most recent piece. I also incorporate interviews conducted with the composer and performers throughout the paper to complement the scholarly information.

For Reich's late repertoire, Rob Haskins' reviews contain the most relevant and substantial content. He describes isolated pieces (no chronological progression) to point out the evolution of reoccurring musical elements, while abstaining from referencing the composer's life or influences. Many authors also proceed in this manner including George Grella (2014) who briefly describes *Pulse* by focusing on its main musical techniques. He, thus, directly contributes to the understanding of Reich's style evolution and the focus of the structural analysis of *Pulse*. In other words, the descriptive methodology employed by these key authors greatly influenced the procedures of my analytic reflections on Reich's repertoire and his most recent piece.

Although most scholars display some kind of evolution in Reich's compositional process, they either do not acknowledge that that evolution contains stages or phases of development or, if they do, the focus is only on the composer's early pieces. An analysis of the available scholarly literature as well as Reich's own observations suggest a tri-partite stylistic division as follows:

First Period-Phasing and Early Style

Phasing, Gradual Processes, and Simple Instrumentation (1965-1973)

Beginnings of Texture, Expanded Instrumentation, and Harmony (1973-1979)

Second Period-Development of Melody, Motives, Harmonic Structures, and Canons

Vocals, Speech Melodies, and Video (1981-2006)

Counterpoint Series (1982-2003)

Instrumental Compositions (1984-2005)

Third Period-Synthesis and External Genres (2006-today)

Harmony and Canons

Vocal, Tape, and Video Works

Arrangements

Melody and Rhythm

This division of Reich's output does not take into consideration concept pieces, *Slow Motion Sound* (1967) and *Pendulum Music* (1968), since these do not contribute to the overall style evolution and the analysis of his most recent work. His early film soundtracks, *Plastic Haircut* (1963) and *Oh Dem Watermelons* (1965), as well as any early works that involve elemental experimentations with tape, like *Music for two or more pianos* (1964) and *Livelihood* (1964), again do not provide insight into Reich's most recent work. The stylistic division I propose considers these pieces as precursors to phasing. This classification also takes Reich's music theater pieces and vocal works into minimal consideration as they seem to stand apart. Overall, each period includes quotes from many scholars as well as the composer's own ideas obtained from published interviews, journal contributions, and other published works. The recent premiere of *Pulse* (2016) diminishes the possibility of available literature on the work, however, the scholarly content that is available and this present analysis together help to establish its placement in the stylistic periods being proposed.

Style and Influence

Before proceeding with the style analysis, it is important to understand what genres and composers influenced Reich's early years and musical education. These seem to group into two

musical sources, Western and non-Western. In his discussion on the influences of different cultures on Reich's music, Robert K. Schwarz (1980) suggests that the composer does not literally reproduce what he learns from other cultures and genres, but incorporates it creatively into his music. This applies to many instances of compositional influence. For example: "The tonal/modal gamut of a Reich work is established at the outset, most typically by the insistent repetition of a brief rhythmic/melodic pattern which, while tonal, may or may not be linked to an explicitly stated harmonic structure. In Reich, tonality is therefore only asserted by repetition, as is Stravinsky's tonality, which is a prime influence on the younger composer" (Schwarz 1980, 377). Thus, similar to Stravinsky's pieces, Reich's use of repetition creates the sense of tonality, but it is safe to say that his music is not intended to recall or allude to Stravinsky.

Reich also draws from jazz and pop in his choice of instrumentation, use of percussions, and manipulation of pulse; and from Pérotin in his inclination towards rapid rhythms in upper registers, sustained notes in the supporting voices, stationary harmonies/modes, and lack of tonal direction (Schwarz 1980, 380-381). In his interview with Rebecca Y. Kim (2000), Reich enumerates a few of his Western influences, supporting the previous claims: "So, in terms of where I come from in the Western music tradition, certainly from Bartók and Stravinsky in this century, but there's a *heavy* dose of medieval techniques. The uses of canon and augmentation are at the top of that list" (358). Reich also praised Bach and the Baroque era for certain techniques, but only in the later periods of his career do these concepts of traditional Western music become prominent in his works (Schwarz 1980, 381). Furthermore, Reich resisted the serialism techniques taught at Colleges and Conservatories because harmony and rhythm defined his musical language. Debussy's treatment of harmony attracted the composer, specifically in terms of cadential hierarchies. In his interview, conducted by Marc Mathey (2004), Reich explains that harmonic

relationships such as II-I and IV-I can replace the tiresome V-I cadence: “So when Debussy opens up the modes those in the whole tone system; he’s saying harmony of one sort is very tired but harmony is not finished [sic]” (313). Overall, all these Western influences strongly contributed to Reich’s style as all the mentioned techniques are common practice in his compositions.

Reich’s non-Western influences include West-African music, Balinese gamelan, and Hebrew chants. During his trip to West-Africa in 1970, Reich primarily studied polyrhythms, but he also discovered that his previous music did not greatly differ from what he was learning about performance techniques, rhythm, and the use of percussions. "Reich was fascinated with the dense, extraordinarily complex rhythmic structure of West African music, which is built up by means of *polyrhythms* [...] What Reich discovered was that the structure of West African music was not that different from his own" (Schwarz 1996, 72). These elements influenced the pieces *Drumming* (1970-71) and *Clapping Music* (1972). Between 1973 and 1974, elements of Balinese gamelan more prominently affected Reich’s compositions: "Now a whole new realm opened up before him, that of the Balinese *gamelan* [...] That shift in emphasis means that Reich has compromised the clarity of the musical process, a primary tenet of his minimalist credo" (Schwarz 1996, 78 and 80). In other words, appreciating the soundscape became the aim rather than understanding the process. The study of gamelan resulted in the composition of one of his most famous works, *Music for 18 Musicians* (1974-76), among others. Lastly, in 1977, while reconnecting with his Jewish heritage: "Reich discovered a new and inspiring kind of musical structure [...] Although scriptural cantillation may have helped inspire Reich's new melodic gift, we would be wrong to search for overt 'Jewishness' in *Tehillim*" (Schwarz 1996, 84 and 88). Thus, the latter piece, *The Cave* (1993), and many works that followed originated from Reich’s exploration of his heritage. The stylistic periods delineated below cover in more detail the implications of these three main non-Western

influences, save for the impact of Hebrew chants which obviously influenced his vocal/technologically based works. As mentioned previously, the present thesis does not extensively discuss these pieces. Nonetheless, it is important to put Reich's compositional output into perspective.

From the beginning of his career, critics and scholars imposed the minimalist label on Reich despite his rejection of this term. Before venturing into stylistic periods, I must first answer the important question: what is minimalism? Timothy A. Johnson (1994) offers different points of view regarding the term and the analysis of minimalist music, and attempts to apply all three considerations (aesthetic, style or technique) to different composers. He finally argues that minimalism should be considered a technique because it "allows the affinities of related pieces to be recognized" whereas considering it an aesthetic or style does not reconcile the lack of homogeneity in the compositions and, therefore, does not allow for numerous pieces to be interpreted as globally relevant to one another (749). Specifically, he enumerates the five minimalist techniques pertaining to the style (a balance in bright rhythmic texture, repetitions, short melodic lines, simple harmonies, and formal continuity) and suggests that if two or more of these techniques are used directly or expanded then a piece has minimalism as a compositional property (751). In addition to Johnson's argumentation, Kyle Gann, Keith Potter, and Pwyll ap Sion (2013) also present minimalist components that I incorporate into my reflection of *Pulse*. The supplementary features applicable to Reich's music are the use of drones, gradual processes (additive, subtractive, and phase-shifting), metamusic (psychoacoustic by-products), and audible structure (4-6). As will be established below, Reich incorporates and develops all the mentioned techniques throughout his years of composition.

This section concludes the overview of Reich's style and influences. The literature incorporated into the argumentation presents substantial historical and theoretical information that assists in building an understanding of the composer's techniques. In turn, this understanding allows the reader to find links as well as reoccurring procedures in Reich's output that suggest a division of his compositional output into three distinct style periods.

First Period-Phasing and Early Style¹

Phasing, Gradual Processes, and Simple Instrumentation (1965-1973)

Reich chanced upon the phasing technique during his composition of the pieces for tape *It's Gonna Rain* (1965) and *Come Out* (1966). Schwarz (1980) explains that "Early in 1965, Reich discovered that, by making tape loops of these already remarkably melodious voices, he could both heighten the musical quality of the speech, as well as intensify the meaning of the words" (384). Although the pieces are deprived of standard melodic content, the clearly audible work on fragmentation and gradual rhythmic shifts resulting in systematic textural buildup foreshadows following works in instrumental phasing. He experimented with these tape loops once more with *My Name Is* (1967) before moving on to his first attempt at instrumental phasing with *Melodica* (1966), an elementary rendition of the technique, and *Reed Phase* (1966), a work since considered a failure by the composer.

Reich consequently applied this technique, a canon with gradual transitions, to *Piano Phase* (1967) and *Violin Phase* (1967), his most recognized early instrumental phasing pieces. In both cases, as in the previous two experimental instrumental phasing compositions, the primary melodic fragments intertwine as the piece progresses, which creates the impression of a series of

¹ Please view Appendix A1 for a list of all the pieces and style elements of this period.

new shifting short melodies. *Violin Phase* is a step further from its piano counterpart because of the use of four instruments instead of two and Reich's conscious employment of what he calls psycho-acoustic by-product: "unforeseen polyrhythmic, melodic, and harmonic combinations that occurs as a result of identical material being phased against itself" (Schwarz 1980, 387). This driving force is also clearly audible in *Piano Phase*, with its gradual shifts creating a wide variety of melodic and rhythmic interplays. However, based on the literature, Reich only consciously applied this technique while composing *Violin Phase*, the previous work most likely serving as a further exercise in experimentation and discovery. In 1968, A year after the premiere of these pieces, Reich wrote *Music as a Gradual Process*, in which he "aggressively asserted the primacy of clarity and audibility of structure that he achieved by creating compositions in which the 'process' (such as phasing) and the content are identical" (in Schwarz 1996, 69). Despite this strong compositional inclination, only three years after the publication of this book, Reich diverted from this ideal and began exploring new rhythmic, harmonic, and melodic elements.

The use of counterpoint/canons is the main output from Reich's pieces in this period. The technique simply changed and evolved with his writing experience. He previously stated that he is a contrapuntal composer at heart and that his compositions consist of "rhythmic constructions" or rather slow build-ups and developments of canonic subjects (Schwarz 1990, 251). In his interview with Kim (2000), Reich explains that phasing was essentially a term he used to characterize the type of canons he was employing: "they were all canons. It's all canons, they're nothing but canons, from the thirteenth century to now. What I use that word "phasing" for is simply to refer to a canon between a very short melodic pattern, as opposed to an extended melody, and done very tight unto itself rhythmically, as you find in strettos" (351-352).

Only a few years after his phasing pieces, Reich composed *Four Organs* (1970), which expands from canonic to gradual processes. In other words, instead of hearing a melodic fragment phased against itself, a chord gradually expands in length through a slowing down of each note's arrival time or rather a lengthening of each note. Thus, this work contains a gradual augmentation process of one chord while no other musical components alter: "It takes about twenty minutes for the chord to grow in duration from a brief pulsation to a lengthy mass of sound. In the meantime, there are no changes of pitch, timbre, dynamics or harmony" (Schwarz 1996, 70). *Phase Patterns* (1970), also written for four electric organs, applies the instruments as percussions through paradiddle rhythms, a concept seen in many of Reich's works. The rhythmic superimpositions created by each instrument are immediately apparent in this work. As a whole, one can hear the composer's progress in the use of this technique as each fragment, even in transitions, is a lot clearer than in his previous works.

Following these pieces, Reich continued evolving musically with phasing elements and gradual processes in *Drumming* (1970/71) and *Clapping Music* (1972). Up until this point, his interest in percussions and rhythm manifests frequently. As Dan Warburton (1988) explains, this interest developed further with the use of block additive process ("replacing rests by beats"), a new compositional technique that stemmed from *Drumming* and was consequently applied to *Clapping Music* (148). It is important to remember that these two works were a result of the composer's trip to West-Africa and his study of its rhythms. As Reich (2002) states in his book *Writings on Music 1965-2000*: "*Clapping Music* marks the end of my use of the gradual phase shifting process. *Six pianos, Music for Mallet Instruments, Voices and Organ, and Music for Pieces of Wood*, all composed in 1973, use the process of rhythmic construction, or substitution of beats for rests, first used in *Drumming*, as well as the process of augmentation similar to that in *Four Organs*" (68).

Music for Mallet Instruments connects to a later period of style because of the addition of other musical elements (see following sub-section).

Returning to *Drumming*, another new concept found in the work is the addition of form (four movements) accentuated by changes in sonority. Philip Duker (2013) analyses the piece by looking at form through pitch register shifts, rhythm through block additive process, and melodic analysis through pitch class sets and phasing. He ties a few elements together to suggest a directional structure: "Given that the sequence of phase relationships in *Drumming* is goal-oriented, and since the previously discussed processes of block addition/subtraction and timbral/instrument changes can all be understood as similarly teleological, one might conclude that this piece is indeed structured toward a series of endpoints" (162). In other words, rhythm and/or short melodic/rhythmic repetitions are still prominent, but other musical elements that contribute to the creation of form slowly begin to enter into Reich's compositions. Warburton (1988) adds that textural additive process (gradual addition of instruments to create a denser texture of sound) is another new element that Reich included in this piece and inserted into *Music for pieces of Wood* (1973) as well (156). The latter work sounds quite similar to *Drumming* in its textural and rhythmic development, most likely because of the use of percussive instruments, but it is much shorter and less complex.

Russell Hartenberger (2013), a percussionist in Steve Reich's musical ensemble *Steve Reich and Musicians*, claims that *Clapping Music* (1972) and *Six Pianos* (1973) were the last of Reich's solely rhythmic focus works (371). Schwarz (1981-1982) also supports this delimitation. He elaborates on the different elements of *Six Pianos*, compares it to *Drumming*, and establishes the similar elements as well as the evolved techniques. For example, both works employ block additive process, however, in *Six Pianos*, Reich states that: "instead of slow shifts of phase, there

is a percussive build-up of beats in place of rests” (in Schwarz 1981-1982, 239). We can also hear tonal shifts throughout the work, that create three distinct sections which complement Reich’s new rhythmic manipulations. Despite these harmonic changes, the piece nonetheless sounds like a straightforward progression from one idea to the next. Schwarz (1981-1982) expands on the piece’s elements and Reich’s direction as a composer by declaring that "an interest in beauty of sound as an end in itself, a lessening of concern in the surface clarity and audibility of the musical process, a richness of texture and sonority, an expansion of the vocal and instrumental resources, and a new use of harmony as a structural element, all reflect Reich's shift away from his dogmatic, austere minimal earlier aesthetic" (241).

Phasing led to techniques such as gradual augmentation, textural additive, and block additive processes. Then Reich introduced distinguishable forms heard through changes in sonority. Following the phasing and early style is the second section of this period of composition where harmony begins to appear in the delimitation of structures, melodies expand to longer fragments, and Reich gradually works on textural development. Unlike the pieces in this section, the following works employ different instrumentation and contrasting timbres.

Beginnings of Texture, Expanded Instrumentation, and Harmony (1973-1979)

The following section contains pieces that show reoccurring extended melodic lines, augmentation and diminution, goal-directed harmony, and expansion of texture and timbre. *Music for Mallet Instruments, Voices, and Organ* (1973) exploits mixed timbres, canonic sub-pairings, long held sounds, and melodic fragments combined with short rhythms (Kim 2000, 346). These short rhythms (block-additive process) stem from *Drumming* while the other aspects are new to Reich’s repertoire. This piece also represents the beginning of tonal exploration with the emergence of cadential patterns that delineate the four sections of the work. For example, the

augmentation technique, first employed in *Four Organs*, focuses on a pattern “rather than prolonging one note at a time as in the earlier work, elongating the entire “cadential” pattern over progressively more and more measures” (Schwarz 1981-1982, 241).

Music for 18 Musicians (1974-76) is one of Reich’s works that inspired extensive analyses and explanations. Process through repetition remains as well as block additive and subtractive procedures, but the melodies are much longer and a new musical direction appears through form and slow harmonic shifts. Innovatively, augmentation presents itself throughout the entire piece which creates an arch form (ABCDCBA). Later compositions utilize and develop these musical components. As Johnson (1994) states: “In this work, Reich extends his customary rhythmic compositional method—substituting notes for rests, gradually building a complete rhythmic pattern—to the formal structure of the entire work, resulting in a large-scale arch form (ABCDCBA) with interrelated section” (749). The eleven non-classed chords heard at the beginning, end, and separately throughout each section are the formal construction of the piece (Mathey 2004, 105). Another innovation is the use of human breath for rhythmic purposes (the creation of rising and falling (< >) patterns): “[...] new in Reich’s music, is the employment of human breath as a measure of duration. The entire opening introduction and closing epilogue of *Eighteen*, as well as the middle portions of each of the eleven central sections of the work, utilize pulses played by the voices and the winds” (Schwarz 1981-1982, 246). This element also returns in subsequent pieces. Larger numbers of contrasting instruments and a denser texture became a strong focus in this compositional period and this emerges in *Music for 18 Musicians*. Lastly, as in *Drumming*, non-Western influences are evident in this work, specifically, Reich’s study of Balinese gamelan.

In *Music for a Large Ensemble* (1978) and *Octet* (1979)², the compositional techniques enumerated above play a prominent role. However, the primary innovation in these two pieces is the further extension of melodic lines (Schwarz 1981-1982, 255-256). These melodic lines interact with short rhythms as well as long held sounds, but unlike in *Music for 18 Musicians*, they are prominently heard in the foreground. For *Variations for Winds, Strings, and Keyboards* (1979), Reich states in a 2003 interview that he changes tonality gradually, unlike his usual sudden shifts, but this is not a concept he is willing to perpetuate since he believes that it was ineffective: “Generally, I don’t change key, I do it suddenly. In *Variations*, it is done that way. It is done gradually. That’s the only piece like that because I felt that it was not successful” (Mathey 2004, 342). Even though the harmonic movements help to delimitate the different variations and give direction to the work, the harmonic progressions do not suggest a definitive formal structure. These harmonic shifts are truly the focus of this piece and they resemble no other prior work. However, Reich’s interest for extended melodic lines continues, *Variations* containing perhaps the longest melodies heard thus far, and his use of canonic sub-pairings as well as block additive processes return once more.

This period marks the beginning of varied instrumentation which contributed to a more tonal and harmonic language. Nevertheless, Reich maintained a focus on rhythmic interplay and melodic expansion. Process remains while form and harmony develop gradually. Both *Music for Mallet* and *Music for 18 Musicians* show Reich’s new harmonic focus, and *Music for Large Ensemble* and *Octet* demonstrate an extension of melody. *Variations*, on the other hand, centers on harmonic experimentation. Throughout this entire period, Reich discovered his musical

² Later arranged slightly differently and published as *Eight Lines* (1983).

language as longer melodies appeared in his works, which leads to the next period where these melodic lines become a primary focus.

Second Period-Development of Melody, Motives, Harmonic Structure, and Canons³

At this point in my analysis, I regroup pieces based on their similarities as vehicles of expression: voice and video, the *Counterpoint Series*, and instrumental. In each, Reich develops melody, motives, and canons, while counterpoint and rhythm are constant prominent factors in his compositions. I insert an independent section for the *Counterpoint Series* since the works are a part of a separate series despite their instrumental nature and they reintroduce tape/live music juxtapositions.

In this period, Reich works on perfecting vocal treatment (speech melodies) and incorporates video recordings to support his compositions (documentary theatre). Also, his instrumental works as well as the *Counterpoint Series* are of great interest for the analysis of *Pulse* because of their instrumental nature. *Pulse* is not a vocal piece nor a video work, thus, I only briefly address the pieces in the following section and only to the extent of their relevant musical contributions for understanding Reich's instrumental development.

Vocals, Speech Melodies, and Video (1981-2006)

Reich obtained melodies, harmonies, and rhythms through the manipulation of recorded voices (speech melodies) and introduced his documentary theatre style that incorporated video in the performance of a piece. These works recount stories or focus on a given message. Even though voice was used in previous pieces, the most innovative treatment of vocals appears in this period.

³ Please view Appendix A2 for a list of all the pieces and style elements of this period.

Pulse is an orchestral piece so I only address the significant instrumental, harmonic, and tonal contributions of the vocal works.

In *Tehillim* (1981), Reich prolongs the melodies to thematic lengths, however, he abstains from the extent of melodic development he undertook in previous works (Mathey 2004, 13). As mentioned in the introduction, this work was a result of his research on his Jewish heritage. This research influenced later vocal compositions such as *Different Trains* (1988), *The Cave* (1993), and *You Are (Variations)* (2004). In *Tehillim*, the vocal treatments display evident canonic sub-pairings and the created rhythms reflect the rhythms of the Hebrew texts used for inspiration (speech melodies). On that note, Reich explains that he used Bach's technique of vocal doubling, i.e. doubling the voices with different instruments, for the creation of different colors (Mathey 2004, 303-304). In other words, he continues to expand texture throughout this period. The arch form, as seen in *Music for 18 Musicians*, presents itself again in this piece and re-emerges in *The Desert Music* (1983). Unlike his previous works, *Tehillim* seems to rely strongly on harmonic progressions for the support of the melodic material. This element manifests through the strong tonal centering at the beginning of each section of the arch form and through the melodic progressions within in each section.

Different Trains returns to sampling with the use of recorded voices' short melodic and rhythmic bits accompanied by instrumental support, as well as train sound samples, but an in-depth analysis is beyond the scope of this section considering that the main advancements are the use of electronic components and speech melodies. Suffice it to say that Reich's blend of the latter techniques creates an emotional and powerful piece making it one of his most popular works to date. *The Cave* concentrates on video (documentary theatre), tape sampling, and formal organisation. Most of the musical development centers around vocal treatment (speech melodies),

specifically the use of accents and phrasing. This work is therefore also irrelevant to the analysis of *Pulse*.

City Life (1995) samples voices recorded spontaneously on the streets of New York city and doubles, with instruments, the melodies and rhythms discerned from these voices. In other words, Reich continues experimenting with speech melodies. He also recorded ambient sounds and played around with metrical ambiguity, which adds further dimensions to the aural experience. Chord cycles, a common interest for the composer when constructing harmonic progressions, also appear in this piece. He develops canons once more, but in this case, the counterpoint is classic in its treatment, giving the work a new form of clarity (Mathey 2004, 14). This development might be a result of the experimentation seen in the *Counterpoint Series* (he composed three works of the series prior to *City Life*), which will be discussed further on. Lastly, an arch form, as seen previously, dominates the formal progressions and the texture is gradually made denser (Glahn 2003, 266).

The next few pieces are primarily vocal so their description will also be brief. Influenced by Pérotin, *Proverb* (1995) employs a series of augmentation canons (Cutts 1999, 43). Reich's speech melodies dictate the rhythmic arrangement of the text and the melodies themselves are a part of the longest heard thus far in his repertoire. *Three Tales* (1998-2002) is a video opera that contains motivic repetition, significant influences from Wagner (exact citation of a theme), Japanese scales, and Yiddish language (Mathey 2004, 291-292). Once again, speech melodies play a prominent role in the construction of the piece. *Know what is above you* (1999) again uses Reich's beloved canons with extended melodies. *You Are (Variations)* also does not contain any progress in compositional techniques (Ginell 2005, 45). In the last vocal work Reich composed during this time, *Daniel Variations* (2006), he employs dominant chords (four minor and four

major) that pulse slowly, at times creating a delay in the direction and the movement of the piece (Haskins 2008, 162). Gradual melodic augmentation also emerges in the unfolding of the vocal melodies.

Lastly, the harmonic treatment in *The Desert Music* resembles the chordal cycle of *Music for 18 Musicians* with added chromaticism and ambiguity. While combining technology and vocal techniques, Reich also writes for his largest orchestra yet and organizes the seating *à la* Bartók: “By seating the strings in two or three separate smaller groups-as in the Bartók Music for Strings, Percussion, and Celesta- each string group can follow its own section leader and contribute its own individual contrapuntal voice” (Reich 1988, 275). An interesting way to analyze this piece is through the fluctuating meter. The counterpoint has twelve units that can be grouped in twos or threes. Gretch Horlacher (2000-2001) quotes Reich as he explains his interest for working with twelve units: “Very often, I’ll find myself working in 12-beat phrases, which can divide up in very different ways, and that ambiguity as to whether you’re in duple or triple time, is, in fact, the rhythmic life-blood of much of my music” (268-269). Horlacher continues by explaining that in the first movement, pulse creates bars that create hypermeasures, in the last movement, these hypermeasures disintegrate through their expansion and contraction, and the ending returns to pulse, thus, creating, again, and arch form.

The emergence of measure from pulse, and hypermeasure from measure, is a goal-oriented process encompassing the entire movement [...] In each of these sections, [...] expansions or contractions of the original dissolve the previous hypermeter [...] there remains by the end of the movement at most a half-note pulse; [...] only as a residue of the movement’s opening. The entire piece has come full circle: pulse returns to pulse (285-288).

This type of interaction between movements, beginning with a pulse and returning to a pulse after an extended period of expansion and contraction, is a compositional tool that emerges in Reich's recent work *Pulse*.

Overall, the mentioned pieces in this section introduces speech melodies and video support. A few pieces in the final era of composition recreate speech melodies, however, without the use of vocals. In the preceding compositions, significant development appears in musical texture and the variety of instrumentation. Harmony and form remain from *Music for 18 Musicians* and Reich expands his melodic treatment through speech melodies and vocal doubling. Lastly, he continues to play with rhythm through his manipulation of 12 units and through the establishment of rhythmic influence on the creation of form. Thus, he develops rhythm and melody, as seen in his earlier works, and continues to do so in the following pieces.

Counterpoint Series (1982-2003)

The *Counterpoint Series* is a group of solo pieces composed at different times, that reintroduce tape (the soloist records himself/herself then plays live with the recordings) and repeated short melodic fragments. However, there are some major differences between these pieces and previous phasing works: the presence of movements separated by different tempos, longer melodies, and quick harmonic shifts (Reich 1996, 19). Textural additive process also re-emerges as each recorded voice enters one by one until the entire texture is complete. Reich's interest in composing for solo instruments emphasizes this entire period's focus on melodic development.

Vermont Counterpoint (1982), written for flute, centers around texture building and the relationship between intertwining melodic lines (Mathey 2004, 88-89). The piece is in four movements, each in different keys, and the most recurring element is Reich's usage of constant

metric modulations that fluctuate inside slow tempos (Glahn 2003, 254). Block additive and textural additive processes are the most evident techniques in this piece as they can both be heard instantly. In *Electric Counterpoint* (1987), metric modulations appear once more with the addition of a neutral dynamic, textural additive process, and various harmonies progressing inside interweaving entrances. Written for electric guitar, this piece's influence stems from medieval times (use of hockets in the third movement) and the precepts in *African Polyphony and Polyrhythm*, specifically the use of suppression with transposition, deviation of accents, and block additive and subtractive processes (Mathey 2004, 89-96). In other words, this piece mostly experiments with rhythm and melody.

New York Counterpoint (1985), written for clarinet, is in three movements and contains a series of pulsating chords that disappear and reappear in ways that create chord cycles. These chords exist more for their color than for harmonic purposes, reflecting both jazz and Debussian sonorities. Reich plays with pitch extremes in this piece giving the B-flat clarinet the highest note in its register and the bass clarinet the lowest (Mathey 2004, 255). The twelve-group fluctuating meter discussed in *The Desert Music* arises once again to create metric ambiguity. This is the case especially in the last movement where, while the clarinets remain stable, the bass clarinets emphasize both the 3/2 and the 6/4 possibilities in the 12/8 metric (Cazé 2010). The melodies in this piece are much shorter than the ones in the works above, sounding more like short fragments presented one after another than extended lines.

In a 2003 interview, Reich stated that, like in *New York Counterpoint*, he employed chord cycles once more in *Cello Counterpoint* (2003) (Mathey, 2004, 343). The latter work is the most harmonic sounding piece out of all the works in the *Counterpoint Series*. Allen Gimbel (2006) explains that *Cello Counterpoint*'s main features are rapid rhythms and a freer form: "The piece is

described as fast-slow-fast in form, but since it is continuous (there are no track divisions) the effect is of one sustained rapturous movement (the “slow” middle section sounds like a dominant extension, almost like a cadenza in eight-part canon)” (175). The piece combines extended melodies and shorter fragments with a free form and a strong harmonic focus that truly gives the impression of continuous melodic and harmonic progressions.

The *Counterpoint Series* is an exercise in solo instrument melodic development with the usual Reichian rhythmic progressions, and formal as well as textural experimentation. Reich returns to mono-instrumental works, as seen in his first era, to develop his melodic and canonic compositional techniques, incorporating notions that he acquired throughout his years of musical experience. With these works, he expands his counterpoint while consistently playing with rhythm, metric modulations, 12 group sets, and harmonic shifts incorporating either rapid key changes or chord cycles.

Instrumental Compositions (1984-2005)

The final section includes all the instrumental works of this period. They show a unified interest in canonic textures, arch forms, harmonic cycles, and rhythmic fluctuations. Also, a continuous pulse seems to be another unifying factor. With *Sextet* (1984), Reich returns to a purely percussive piece in which harmony or a cycle of chords determines the arch form ABCBA similar to *Music for 18 Musicians*, *Tehillim*, and *The Desert Music* (Mathey 2004, 117). The use of counterpoint is also extremely important in this piece as the melodic manipulations create up to three-part canons (Schwarz 1990, 251). The fragments phase against each other to create this canonic effect. Reich also uses block additive processes to manipulate the rhythmic effects of these fragments as well as the 12 beat metric modulations seen in previous works. In other words, despite the development seen in harmony, melody, and timbre, this piece “focuses on contrapuntal

processes, thereby demonstrating how canons have persisted in Reich's music" (Schwarz 1990, 251). This is a notion to keep in mind when analyzing *Pulse* since canonic treatments have always been a prominent factor in the composer's works.

For *Three Movements* (1986), Reich states in a 2001 interview that Schönberg was his inspiration although the work rather resembles Stravinsky's style: "There was an interest in Schönberg (believe it or not) and the piece *Farben*, colors, changing colors on a lake [...] It may sound more like Stravinsky than Schönberg, but in the thing, it was actually coming out Schönberg" (Mathey 2004, 324-325). He refers here to the first movement where the notes in the vocal interchanging stem from the sonorities of one chord (325). The rhythmic creations in this work do indeed remind the listener of Stravinsky. Also, textural additive process begins with a pulse and moves into stronger rhythmic manipulations that turn into melodic fragments. These fragments become melodic lines, beginning in the second movement, which are subsequently doubled in canon. Reich then transcribes these canons into other voices gradually densifying the entire texture, similar to the work done in the *Counterpoint Series*. The last movement also utilizes the metric modulations discussed above.

The Four Sections (1987) also employs canons in three, however, the difference lies in the augmenting tempo from slow to fast (Mathey 2004, 157). Every movement contains four harmonic sections, each given to separate instrumental groups, as well as an introduction and coda or transition (Mathey 2004, 163). This particular harmonic treatment is a new development in Reich's output. However, like Debussy, color prevails over function and the choice of bass note interplay contributes to tonal ambiguity (Mathey 2004, 189). Textural additive and subtractive process appears instantly in the first movement and the interlocked and canonic melodic lines sway gently within the growing and receding texture. The second movement remains peaceful with its long

melodic lines, but Reich gradually adds a complementary rhythmic element to the percussive movement. The third movement brings back an entering and receding pulse that supports the canonic interplay of the woodwinds. The fourth movement employs all of the elements enumerated above and includes metric modulations.

Both of the following pieces, *Duet* (1993) and *Nagoya Marimbas* (1994), are throwbacks to the early phasing technique, not only because of the canonic treatment, but also on account of the limited instrumentation and indistinguishable timbres. However, the works show progress in the melodic elements as seen in Reich's more modern pieces. This might be a result of his experimentation with the *Counterpoint Series*. *Duet*, for two violins and small strings orchestra, employs cross-rhythms with unison canons (Reich 2002, 183). *Nagoya Marimbas* uses repeating patterns, in and out of phase, that are however more melodic, repeated a minimal amount of times (therefore modified more often), and more challenging to perform than the phasing pieces of the 1960s and 1970s (Reich 2002, 184). Reich shows his progress in canonic construction explicitly in these works by setting the same type of instrumental relationships and letting the evolution he accomplished as a composer in this treatment of counterpoint speak for itself. His other pieces show canons, but, in these works, the counterpoint framework exists inside a larger harmonic and formal palette making the repetitive elements and their progressions harder to isolate by ear. Reich then exhibits his graceful melodic lines and his undeniable capacity to play around with fragmentation to create fluid progressions.

Triple Quartet (1998), inspired by the last movement of Bartók's Fourth String Quartet, reproduces the Reichian chord cycles and the longer melodies encountered in many previous pieces (Mathey 2004, 171). A new strong tonal infrastructure, with the use of dominant cycles, is one of the major contributions of this work because it contrasts Reich's previous interest in tonal

ambiguity without however oversimplifying the harmony. Another factor of compositional expansion (influenced somewhat by Gordon's *Yo Shakespeare*) is the frequent use opposing rhythms in each quartet: "The quartets often play in conflicting rhythmic patterns [...] The harmonies never leave a firm tonal foundation [...] the chords themselves are reminiscent of those for his *Desert Music* (1982-84) but easier to hear, perhaps because of the unified string quartet timbre" (Haskins 2002, 155). Lastly, perhaps unintentionally, Reich seems to employ Eastern European scales and rhythms in this piece. These are especially heard at the center of the work.

Dance Patterns (2002) and *For Strings (With Winds and Brass)* (1987-2004) contain old techniques that do not contribute to the advancement of Reich's language. The last piece in this section is *Variations for Vibes, Pianos, and Strings* (2005). A constant pulse as well as block additive and subtractive processes appear as predominant techniques in the musical language of *Variations* (Haskins 2008, 162). Reich (2005) wrote in the composer's notes that this piece is more modular than his more recent works and that the melodic and harmonic texture densifies as the music progresses. Thus, he combines both old and new compositional techniques: "Throughout the piece there is a return of my old technique of substituting sounds for silence thereby filling up rests in the melodic material - as well as adding sustained harmonic voices as each variation progresses. *Variations* therefore start out in their simplest and barest form and gradually accumulate more melodic and harmonic material as they move along" (Reich 2005).

Universally, during this period, Reich incorporated old notions and developed melodically, rhythmically, harmonically, and formally. His instrumental works show a progression in harmonic structures and canonic interplay. Speech melodies, canons, longer melodic material, and harmonic processes that help to delimitate form are the newest contributions to his musical language. It is again apparent that both Western and non-Western influences contribute to the evolution of his

style, and Reich's interest in combining modern technology with music to discuss religious or societal topics adds to his versatility. Most useful for the analysis of *Pulse*, however, is Reich's development as a contrapuntal and instrumental composer through the *Counterpoint Series*, with its use of tape creating different melodic and rhythmic interactions, and his instrumental works that continue to expand his language and style. At this point, Reich appears comfortable in his musical direction as he persistently reemploys these techniques in the following era of composition.

Third Period-Synthesis and External Genres (2006-present)⁴

The pieces in this period (2006-present day) sum up Reich's compositional development. In his previous instrumental works, the composer already began to synthesize elements of his musical style while expanding certain techniques. In this period, the explicit influence of rock, pop, and jazz components are a notable addition to his compositional practice. Another convenient reason for this separation is the ending of both the *Counterpoint Series* (2003) and vocal works (2006). The pieces occupying the third period are purely instrumental. Considering the proximity of these compositions to present day, there is understandably little secondary literature that addresses their content.

Harmony and Canons

The works in this section summarize Reich's development in harmonic colouring and canonic manipulation. Both following pieces contain no new developments in Reich's style. The primary focus of *Double Sextet* (2007) is the use of canons and harmony for the creation of form,

⁴ Please view Appendix A3 for a list of all the pieces and style elements of this period.

and metrical modulations (Haskins 2010, 178). It also manipulates pre-recorded tape in the same manner as seen in the *Counterpoint Series* (Castanet 2012, 102-103). Thus, we hear once more interlocking rhythms and melodic fragmentation similar to previous works. However, harmonic shifts, long held notes, and longer melodic lines dominate the texture and complement the rhythmic interplay. In *Mallet Quartet* (2009), Reich once again concentrates on harmony and employs an instrumentation that resembles his early works to help the audibility of phase shifting melodic fragmentation. These melodies are nonetheless much longer than those heard in his early works. Despite this, the piece has a clear harmonic focus. Block chords, influenced by pop and jazz, complement the rhythmic and counterpoint filled background (Kosman 2010). Thus, these two pieces replicate previously used techniques. The major difference between the two lies in *Mallet Quartet's* thinner texture and restricted instrumentation.

Quartet (2013) is the epitome of Reichian harmonic experimentation with its extensive modulations summarizing years of work in color and texture. The formal properties remain similar comparing to previous works and the harmonic focus appears once more as a directing factor in the global perception of the piece. Counterpoint, as always, is an important element and the stop-action design of the melodies reinforces Reich's melodic development: "Inside the larger sections, there is a start-stop structure to the music, with musical statements coming to a clearly defined pause before moving on to the next section" (Grella 2014). These melodies are, again, much longer than those heard in earlier pieces. The work also exemplifies Reich's typical disregard for tonality through the created colors reminiscent of Debussian harmony. The cited author, George Grella, states that these colors of polytonality are unexpected, but as demonstrated through Reich's progress as a composer, it is common practice in his music.

Tape Works

The two works in this section both employ tape while only one also incorporates speech melodies. Not much scholarly commentary is available on *2x5* (2008), but the little information I have found suggests that it is a percussive work, influenced by the rock genre because of its instrumentation, that juxtaposes live musicians and pre-recorded tape (Haskins 2010, 178). The form, rhythmic focus, and interactions resulting from the manipulation of tape recordings are all common elements in Reich's repertoire. Ultimately, the increased harmonic focus and the sonorities created by the rock genre influence contribute to the novelty of this work.

WTC 9/11 (2010) is a dedication piece that serves as a remembrance of the attack on the World Trade Center. The adoption of previous techniques is frequent and numerous: "The pulse and repeating musical fragments are familiar; the clusters of diatonic scales that are created by Reich's "stop-action sound" supply the kinds of harmonies that permeate many of his works from the late 1970s and early 80s; even the dissonances of the first movement, in particular, are not new (*Proverb* and *Triple Quartet* furnish similar examples)" (Haskins 2011, 155). This piece, like many others including *2x5*, uses tape and recordings. Specifically, Reich records numerous peoples accounts on the happenings of 9/11 and uses their voices as fragments for speech rhythms or speech melodies, another technique previously seen in Reich's music. The only major nuance on his compositional approach is the use lengthy notes to create an ambiguous tempo (in the slow movement) (Haskins 2011, 155).

Arrangements

The following two pieces are arrangements of previously written works, a compositional focus not seen in the composer's previous repertoire. Reich wrote *Finishing the Hat* (2011) as an arrangement of Sondheim's *Sunday in the Park with George*. After a few comparative listens, the work sounds melodically and harmonically similar to the original piece, however, Reich adds his

typical rhythmic and repetitive elements to the work. For example, the ever-shifting time signature contributes to the piece's rhythmic ambiguity and gives it a Reichian flair that is easily recognizable.

Radio Rewrite (2012) is an adaptation of two songs by the band Radiohead (*Jigsaw Falling into Place* and *Everything in its Right Place*). The piece transforms the latter two by making the connection rather minimal with the inclusion of only short harmonic and melodic traces (Haskins 2015, 149). Thus far, Reich's musical evolution bases itself partially on the expansion of previous material, and the style of a certain period connects pieces by the correlative use of compositional elements. The composition of *Radio Rewrite* remains in this norm with its chord cycles resembling *Double Sextet* and with its tempo manipulations of slower movements comparing to *WTC 9/11* (Haskins 2015, 149). Extended melodies coupled with shorter fragments also appear once again in this piece. Overall, Reich returned to previous techniques for the composition of both these pieces.

Melody and Rhythm

Runner (2015) and *Pulse* (2016) are Reich's most recent pieces, thus, limited information exists on their content. The first, written for large ensemble, is a work that accompanies a ballet choreographed by Wayne McGregor. As Reich explained in an interview with Paul Kibley (2016), in five consecutive movements, he continues his experimentation with rhythmic ambiguity, this time being influenced by Ghanaian rhythms (West-African influence):

'I was watching an Indian movie', Reich explains. 'It had that "tick-a-tick-a-tick-a" [rhythm], very upbeat, very invigorating. I didn't quote the music but that 16th-note action found its way into the opening of the piece.' [...] The slow central section uses a rhythmic pattern common in Ghanaian music. 'It's a superb way of dividing twelve up so that you have no idea where the downbeat is. And

rhythmic ambiguity is essential if you're going to write repeating music'.

This rhythmic technique is a reminder of Reich's previous work with ambiguous rhythms. Melodically speaking, he continues to develop as a composer through the creation of longer melodic lines and his experimentation with texture: "The piece's most powerful innovation, though, is the way the composer keeps pulling melodic threads out of the instrumental texture and highlighting them as thematic material" (Kosman 2017). Even though Reich attempted on numerous occasions to interweave melodic material and texture, in this work, the relationship becomes even more apparent through the canonic interactions and powerful harmonic presence.

Lastly, when writing the pulsating rhythm of *Pulse*, Reich claims that he was somewhat inspired by modern electronic music (see Chapter 2). Harmonically, his direction stems, unsurprisingly, from a previous work. In his composer's notes, Reich (2015) writes: "*Pulse* was completed in 2015 and was, in part, a reaction to my *Quartet* of 2013 in which I changed keys more frequently than in any previous work. In *Pulse*, I felt the need to stay put harmonically and spin out smoother wind and string melodic lines in canon over a constant pulse in the electric bass and or piano." George Grella (2016) explains similarly that the melodic treatment appears most frequently through canons and tutti repetitions. At the New York rehearsal, Jacob Greenberg, the pianist, stated that out of all of Reich's piece, *Pulse* contained a heightened awareness of melodic content (Betta 2016). Once more, the composer includes a great deal of rhythmic and melodic development in the piece. *Pulse* unfolds slowly and seamlessly making it potentially the most tranquil piece written by the composer. The ambiguity of the developmental structure creates an analytic challenge which strengthens my initial inclination to make it the second target of my analysis.

Overall, deciphering *Pulse* requires understanding both the compositional techniques most common in Reich's music and the analytic methods employed by scholars. The scholarly writings on historical information produce a thorough outlook on the evolution of Reich's style and how his techniques developed, and facilitate the delimitation of his stylistic periods. These separations manifest only by exposure to the literature, an analysis of the results, an evaluation of sheet music and recordings, and an examination of the consistencies and irregularities of the composer's techniques. [deleted sentence] From this point, we can approach the analysis of his most recent work and attempt to situate it in relation to the discovered style evolution.

Chapter 2: Comparative Analysis of *Pulse*

When approaching the analysis of Reich's music, the various compositional traits delineating his style periods establish repeated techniques and their development throughout his career. This thesis attempts to connect *Pulse* to most of the pieces in Reich's extensive repertoire. The ones that are not mentioned tend to reflect or follow the techniques and procedures of more substantial works. Thus, a thorough revision of Reich's previous repertoire and the sectionalizing of his works into three periods help to contextualize the intricacies of this piece, as well as the employed techniques, into a larger understanding of compositional procedures, historical relevance, and global significance in the repertoire. Determining *Pulse*'s connection to Reich's eras of composition demonstrates that the piece globally represents the third period, and that a transformation and an interesting relationship exists between the piece's Sections (1, 2 and 3) and Reich's eras of composition. In other words, the research combines history and analysis in order to understand the relevance and significance of Reich's new piece within his repertoire as well as how it relates to or is reminiscent of previous repertoire. The goal is not to isolate history and analysis, but to truly combine the two as an analytic tool. This research process revealed that *Pulse* is both a continuation and consolidation of Reich's writing techniques with regards to melody, harmony, rhythm, and form. In a sense, it is the realization of Reich's compositional evolution.

The objective of the literature review was to determine what has been said about the composer, how his works and his different techniques have been analyzed in the past, and find the most relevant ways, with regards to Reich's evolution as a composer, to analyze his most current piece. The following analysis could have potentially adopted post-tonal theory or minimalist theory to analyze the melodies in the work, for example, or the rhythmic direction, but this

approach does not contribute to the understanding of how *Pulse* relates to the previous repertoire, because Reich's 2016 piece cannot compare to works written in the 1960s-1970s. A few scholars addressed his early works by looking at post-tonal theory (phasing analyzed through set theory, rhythm through beat-class sets, fluctuating meter, etc.), but this approach centered on pieces with identical instrumentation and melodies superimposed onto each other (or phasing). In other words, authors used post-tonal theory to analyze works produced at the beginning of the first era of composition. For example, Dan Warburton (1988) and Philip Duker (2013) employed post-tonal theory to analyze *Drumming* through similar perspectives using set theory among other post-tonal models. Another similar author is Richard Cohn (1992) who analyzed Reich's phasing processes through beat class set variations. These theoretical methodologies, however, only cover the composer's early works as can be determined throughout the first part of the thesis. In other words, the application of post-tonal theory for analyzing *Pulse* would not contribute to the chosen direction of analytic focus. More recent pieces are much denser and much more complex, they have many more elements to consider, thus, analyzing *Pulse* in the same ways that works with identical timbres emphasizing pitch changes or rhythmic ambiguities were analyzed does not seem relevant.

As Reich's compositional methods progressed, scholars centered on more global analyses of form and direction rather than post-tonal or minimalist theory since Reich's music was not solely minimalist or simply post-tonal anymore. The analyses are descriptive and focus on arch forms, the expansion of chords, the relationships between instrument, the use of cycles for the creation of form, and so on. For example, the previous chapter cited Schwarz numerous times to show Reich's musical influences and stylistic evolution, and the author's descriptive analyses were a great aid for the understanding of the composer's early repertoire. He presented the technical factors of each

piece, used sheet music examples, and explained how Reich evolved musically based on those techniques. In *Process vs. Intuition (1990)*, Schwarz discusses the founding components of Reich's music while referring to scores. Relevant to this study are the construction of form, the harmonic cycles employed in *Music for 18 Musicians* and *The Desert Music*; and examples of the use of counterpoint in *Sextet*. This method is very similar to the adopted methodology as the following analysis focuses on previous techniques, demonstrates their application in *Pulse* through sheet music examples, and observes their historic and stylistic relevance. Similarly, Mathey's descriptive analyses helps the present analysis center on important elements of the repertoire. In the second part of Mathey's book, he categorizes Reich's compositions according to musical symmetry/asymmetry or music with text, and complements the information with score examples. This analysis offers insights into the evolving complexities of Reich's compositional elements (rhythm, harmony, melody, tonality, and form) which ultimately becomes pertinent to the analysis of *Pulse*. For example, Mathey (2004) explains that with *Sextet*, Reich goes back to a purely percussive sound in which harmony (chord cycles) determines the arch form ABCBA similar to *Music for 18 Musicians*, *Tehillim*, and *The Desert Music* (117). He complements these observations with sheet music examples of the targeted piece, showing the discovered similarities. This author proceeded in a similar way as Schwarz to analyze a large number of pieces from Reich's numerous eras of composition, which guided the following analysis to also complement the analytic data with comparisons to previous repertoire.

In other words, the thesis combines all the elements addressed in the previous literature, observes the most apparent ones that reappear in *Pulse*, and explains how they relate to Reich's previous works to ultimately demonstrate his evolution as a composer. Fundamentally, the research wishes to show how *Pulse* fits and/or diverges from Reich's usual compositional

direction, and to combine history and analysis to explain how the composer's new work is a combination and culmination of his musical style. In order to attempt this, the thesis approaches the analysis in two ways. The comparative analysis juxtaposes the 3 sections of the work in terms of melodic, rhythmic, and instrumental treatment, and these elements are all related to the stylistic evolution of the composer, as will be demonstrated throughout this chapter. The second area of focus seen in the third chapter is on form. The first approach evaluates the relationship between melodic treatment and instrumental doubling aiding the creation of form; and the second determines how the cycles created by the piano, drones and electric bass, as well as the piano chord fluctuations between steady rhythms and paradiddles contribute to the discovery of form.

This analytic direction is both a strength and a weakness as it is a very structuralist focus, thus, despite the relevant information obtained throughout, there are most certainly numerous different interpretive directions possible. Jean-Marc Chauvel's (2004) explanation on the connection between the structure and form reflects the choice of this methodological pairing: "Structure needs form to define the models of its objects and ensure the correctness of its groupings; form needs structure to make possible on a coherent level its associations and give meaning to similarity" (23). Thus, for the sake of this global analysis reflecting the evolution of Reich's techniques, the intricacies of the structure and how they help to create form are the major focus. Essentially, this chapter uses the theoretical direction of previous literature to create a comparative and formal analysis establishing the numerous compositional techniques appearing in *Pulse*. The analysis then contextualizes the discovered elements in Reich's eras of composition by evaluating which techniques reoccur and how the sections of the piece interestingly represent the stylistic eras. The research compares these techniques found in *Pulse* to those previously used

in Reich's extensive repertoire to evaluate how the work is both a combination and evolution of previous style and technique.

Terminology Specification

At this point of the chapter, it is important to explain the terminology adopted by the analysis for clarity and efficiency purposes. *Pulse* contains 3 sections, the first two of which include 7 movements, the third only one. Every movement with the same given number replicates and develops the melodic and chordal elements of the other. For example, the first movement of the second section develops the primary theme and sonorities heard in the first movement of the first section. Typically, Reich abstains from using formal harmonies, but keeps stable 7ths, 9ths, and 11ths throughout each movement. They vary slightly, but not significantly enough to state an important change of chords, thus, the harmonic or tonal quality of the work is not a primary focus of this analysis. Similarly, the first movement in both sections has two sharps while all the following movements have three, however, atmospheric sonorities replace tonal direction (as discussed in the historical section).

I devised certain abbreviations to simplify the analysis of the music because of the work's size. Many movements begin with an eighth note played on the upbeat. In these cases, the text preceding the example mentions the additional note, but the illustrations omit the upbeat to save space and for reading clarity. Also, some examples contain sheet music reductions, once again, to save space. For reading clarity and efficiency, I capitalize each section when directly referring to it (Section 1, Section 2, and Section 3), abbreviate movements to M1, M2, etc., and refer to primary themes as A and secondary themes or harmonizations as B.

When discussing canonic entrances, which apply to the four woodwinds as the strings only double the melodies at times, I use these capitalized letters for first entrances, while a and b represent subsequent entries. For example, if the four woodwinds, commencing with the Flute 1, enter one after the other playing only the primary theme, the abbreviation for that is Aaa1a2. If two instruments enter at the same time, in this case with both themes, while two others follow shortly thereafter, the result is AaBb, ABaa, etc. In other words, I capitalize the entrances that introduce the canons at the same time and if subsequent canons also enter simultaneously they are labelled the same way: aa, ab or a1a1, a1b1. The canonic entries also vary in order, thus, it is possible to have Aa2aa1, for example, which would signify that flute 1 comes in first, followed by clarinet 1, then clarinet 2, and ending with flute 2. Occasionally, Reich slightly alters the original themes, which is indicated with “~”. In this case, I label the entrances as such: A~a1a for example. Lastly, the first and second violins as well as the violas divide into two parts that I categorize into top and bottom divisi.

Analysis

Pulse positions itself in the last era of composition not only because of the year of the premiere, but also because of the elements it contains. External genres influenced its creation, as Reich claims that electronic music was the global inspiration: “For “Pulse,” Mr. Reich especially took inspiration from the latter group [Daft Punk], crediting the 2013 Grammy-winning album “Random Access Memories” from French electronic-music duo Daft Punk and their collaboration with a pioneer of the genre, Giorgio Moroder” (Betta 2016). He specifically states that a regular pulse is present in all his works, but that for *Pulse*, he wanted to make it the center of attention. He combined the steady beats commonly found in electronic music with his usual focus on pulsating textures. Heard throughout the entire work, this notion appears in the constant pulsing of the

electric bass, that is at times replaced by the piano. It is important to contextualize the musical analysis in the composer's eras of composition by evaluating which elements reoccur and how Sections 1 and 2 represent his evolution as a composer. As will be demonstrated below, this piece combines his compositional processes and the sections of the work serve as stepping stones representing the composer's progression through his stylistic eras.

Melodic Development Within Movements

In Section 1, *Pulse* begins with simple melodic and thematic ideas. M1 focuses on basic melodic treatment and shows immediate interest in the clarinet and flute, that present every theme throughout the work. With the emphasis on melody, Reich indicates, from the beginning, that this work is first and foremost a piece centered around melodic development. The direction of these melodies or themes remains identical throughout Section 1 and Section 3 (upward motion, climax, downward motion), while Section 2 contains significant development. The musicians that performed *Pulse* also mention the melodic quality of the work, an observation that strengthens this hypothesis. The pianist Jacob Greenberg, who performed the premiere of the work with ICE, noticed this focus on melodic content "I can't think of another one of Steve's pieces where you become so aware of his delicate melodies" (Betta 2016). Joshua Rubin, the clarinetist and co-artistic director of the ensemble, similarly stated: "We're still exploring the piece, but it feels very natural, chasing after a little fragment of melody that moves across the instruments. It's like a kaleidoscope, changing the pattern and all of a sudden, you're seeing a new sequence of layers" (Betta 2016). In other words, melodic expansion with a new form of fragmentation less inclined towards phasing, but rather focused on textural development, seems to be Reich's direction with the melodic elements of this work. Examples 1, 2, and 3 reveal this melodic expansion in the piece's main melodic instrument (flute).

Example 1: Section 1, M1, flute melody, mm. 1-12.

where every note of the original theme is reproduced and expanded. This last movement of the work slows down and thins out the texture to a simple melodic line given to the flute.

The flute and clarinet, in the Section 1, always introduce the melodic material which is followed by a canonic repetition given to flute 1 and flute 2. The first violins double these instruments (see example 4) reproducing the theme (flute 1 and clarinet 1) as well as its subsequent repetitions (flute 1 and flute 2). This relationship remains consistent throughout Section 1.

Example 4: Section 1, M1, Fl.1 and Cl.1 reduction doubled by Vln.1 divisi, mm. 1-12.

The image shows a musical score for three instruments: Flute 1, Eb Clarinet 1, and Violins 1. The score is in 3/4 time, key of D major, and consists of 12 measures. The Flute 1 and Eb Clarinet 1 parts are identical, and the Violins 1 part is a reduction of the other two parts, marked 'mp'.

Pulse by Steve Reich

© Copyright 2015 by Hendon Music, Inc. a Boosey & Hawkes Company.

Reprinted by Permission of Boosey & Hawkes, Inc.

Overall, in Section 1, the rhythm of the main themes contains eighth notes that move upwards and stop at chosen held note. Depending on the movement, this process repeats a variable amount of times until Reich reaches the wanted highest note. Afterwards, the melody descends in the same manner with different notes. In Section 2, the rhythm of the melodies begins the same way, however, Reich's uses augmentation to develop the original theme and the melodies expand in direction and pitch. The only movement of Section 3 is a large augmentation and contains a steady pulse in the electric bass as well as an all-inclusive involvement of the strings playing continuous notes (drones). *Pulse* returns to and ends with tranquility after the density in Section 2.

Connections between Section 1 and the works in the first era of composition appear with *Music for Mallet Instruments, Voices, and Organ*. In *Pulse*'s Section 1, Reich reproduces the

canonic sub-pairings in the woodwinds and strings. He also reuses the long-held sounds combined with short rhythms technique in the merging of woodwinds/string held notes and the piano/electric bass pulses and rhythms.⁵ However, in *Pulse*, a melodic focus replaces Reich's extensive use of percussive instruments. In Section 1, the importance allocated to melodic lines is prevalent (with the use of canonic sub-pairings) while Section 2 contains more melodic development primarily based on augmentation. In other words, Reich shows his primal interest for counterpoint with the melodic clarity of Section 1. More examples of the relationship between Section 1 and Reich's first era are works like *Four Organs* that introduces gradual augmentation of a chord and *Phase Patterns* that uses the organs as percussive instruments, both elements noticeable in the piano part of *Pulse* with the gradually expanding chords and paradiddle rhythms (refer to appendix C and example 14).

Canons and Chords

I reserve this part of the analysis to briefly address the main elements of the work's sections. The melodic treatment in the woodwinds in M1 of Section 1 is simple Aa, Aaa1, and Aaa1a2 canons (see appendix B). The pulse in the piano chords enters at the Aa canon and the electric bass pulse begins at the Aaa1 canon while the piano chords continue to expand at each entrance. This relationship between woodwind and pulse entrances presents itself regularly in the entire work. For an example of this type of interaction see appendix C. The electric bass persists throughout the piece in a stable 2/4 meter (except for M5-replaced by piano) while the piano plays around with paradiddle rhythms as will be demonstrated later in the analysis. Lastly, the second violins and the violas create drone sounds that result in sustained chords and this persists as well

⁵ This relationship appears throughout the analysis.

throughout every movement of Section 1. The piano/electric bass contribute to the creation of these chords. In other words, the drone sounds correspond to the notes found in the piano chords.

In M1 of Section 2, the same chord as in the corresponding movement of Section 1 enters with a different instrumental set up and develops chromatically throughout with the melodic and drone involvement of the strings. This type of chordal/melodic borrowing and development between sections applies to all subsequent movements (see appendix D for comparison). Thus, the movements of Section 2 begin with the same chords and themes as Section 1 and develop gradually. Also, the melodies branch out to different instruments (all four woodwinds and violin divisi-see example 5). Unlike in Section 1, both the first and second violins double the flutes and clarinets, and numerous instruments share the theme in short fragments. The melodic involvement of the strings adds to the density of the section leaving only the violas to perform the drone sounds.

Example 5: Section 2, M1, melodic reduction, mm. 277-289.

The image displays a melodic reduction of a musical score for six instruments: Flute 1 (Fl. 1), Flute 2 (Fl. 2), Clarinet 1 (Cl. 1), Clarinet 2 (Cl. 2), Violin 1 (Vln. 1), and Violin 2 (Vln. 2). The score is written in a key signature of two sharps (F# and C#) and spans measures 277 to 289. The woodwind parts (Flutes and Clarinets) and the Violin 2 part feature melodic lines with various note values and rests. The Violin 1 part consists of sustained, long-note passages. Dynamic markings such as *mf* are present in several measures. The overall texture is dense, with multiple instruments contributing to the melodic development.

The image displays a musical score for the piece 'Pulse' by Steve Reich. It consists of six staves, each representing a different instrument: Fl. 1, Fl. 2, Cl. 1, Cl. 2, Vln. 1, and Vln. 2. The score is written in treble clef with a key signature of one sharp (F#). The music is characterized by a steady, rhythmic pulse that is repeated across all instruments, creating a dense, layered texture. The notation includes various note values, rests, and phrasing slurs, all contributing to the overall rhythmic complexity of the piece.

Pulse by Steve Reich

© Copyright 2015 by Hendon Music, Inc. a Boosey & Hawkes Company.
Reprinted by Permission of Boosey & Hawkes, Inc.

Lastly, the rhythmic density is apparent, once more in Section 2, with the added chromaticism and the persistent involvement of the piano's paradiddle rhythm interacting with the electric bass' stable pulse (see appendix E).

In other words, Section 1 employs simple techniques reminiscent of Reich's earlier years such as simple canons, simple rhythms, and drone sounds while Section 2 begins to create denser textures. For M2 and M3 in Section's 1 and 2, the notions presented above apply similarly. M2 in Section 1 still targets basic melodic development while utilizing identical instrumentation and a stable rhythmic pulse in the piano and electric bass. In M3, the paradiddle rhythms in the piano begin to suggest its employment as a percussive instrument. Throughout his repertoire, Reich frequently treats the piano in this manner, thus, this is simply another element that confirms his previous style and contributes to the rhythmic density of the movement. In M2 and M3 of Section

2, Reich borrows and develops the themes and the chords of Section 1 in the same way as seen in M1.

In Reich's works from the year 2006 to present day, a reoccurring element is his interest in synthesizing techniques such as the perpetual use of canons, pulses, expanded harmonies, chord cycles, and atmospheric tonalities. In comparison to works like *Mallet Quartet*, Reich maintains, in *Pulse*, his interest in block chords (as seen in the piano) that dominate the rhythmic background. Similar to *Radio Rewrite*, *Pulse* recreates chord cycles for formal purposes (see formal section) and even a technology-based piece like *WTC 9/11* presents an affinity to the structure of the recent work with the presence of a persistent pulse. Lastly, the lack of a standard tonal direction and the stop-action pattern of the melodic material in *Pulse* resonate with the musical content previously observed in *Quartet*. Thus, *Pulse*, with all its previously described elements, logically positions itself in this era because of the reoccurring characteristics present in other pieces of this period.

Phasing Returns?

At this point of the analysis, it is important to evaluate the discrepancies within M4 to M7. In Section 1, contrary to the previous movements, M4 begins with a harmonization of the main melody. Flute 1 presents A and clarinet 1 introduces B that supports the flute theme. The paired melodies resemble one another in direction and rhythm. In M4, this relationship reaches its peak at the AaBb canon, that creates a melodic density unachieved in prior movements (see appendix F). This thematic pairing returns in each subsequent movement of Section 1 and is typically replicated in Section 2.

The melodies in each movement of Section 2 and 3 expand on the ones presented in Section 1 and different melodic iterations or longer held notes replace some thematic sections. The chords

are also identical at first and expand shortly thereafter. This applies to all the melodic and harmonic reproductions of the movements in Section 2 aside from M4 that adds to the development by incorporating phasing after presenting an upward motion similar to the one in M4 of Section 1 (see examples 6 and 7). Also, M5 alters the melody entirely (see examples 11 and 12) and M7 reproduces the extended melody in different instruments (see appendix G).

Example 6: Section 1, M4, woodwind reduction, mm. 124-138. The upbeat (m. 123) contains the first eighth-note of the flute theme (E) and the first eighth-note of the clarinet theme (B).

The musical score is presented in two systems. The first system, labeled 'IV' and starting at measure 124, shows the following: Fl. 1 plays a melodic line starting with an eighth note, followed by quarter and eighth notes, with a slur over measures 125-126. Fl. 2 is silent. Cl. 1 plays a similar melodic line, also starting with an eighth note and featuring a slur over measures 125-126. Cl. 2 is silent. The second system, starting at measure 133, shows: Fl. 1 continuing the melodic line with quarter and eighth notes. Fl. 2 remains silent. Cl. 1 continues the melodic line with quarter and eighth notes. Cl. 2 remains silent. The score concludes with a double bar line at the end of measure 138.

Pulse by Steve Reich
 © Copyright 2015 by Hendon Music, Inc. a Boosey & Hawkes Company.
 Reprinted by Permission of Boosey & Hawkes, Inc.

Example 7: Section 2, M4, woodwind reduction, mm. 465-481. The upbeat (m.464) contains the first eighth-note of the flute theme (E) and the first eighth-note of the clarinet theme (B).

Pulse by Steve Reich
 © Copyright 2015 by Hendon Music, Inc. a Boosey & Hawkes Company.
 Reprinted by Permission of Boosey & Hawkes, Inc.

On that note, in Section 2, M4's phasing fragments are in an Aab1b2 and A~aBb format (see example 8). The flute and clarinet introduce the melodic material, which is doubled by the first violins. Once the phasing begins, violins 1 double flute 1 and 2, and the top divisi of the violas doubles the clarinet 1 melody.

Example 8: Section 2, M4, phasing reduction, mm. 482-493.

482

Fl. 1

Fl. 2

Cl. 1

Cl. 2

Vln. 1

Vla.

mp

483

Fl. 1

Fl. 2

Cl. 1

Cl. 2

Vln. 1

Vla.

484

485

486

487

488

489

490

491

492

493

494

495

496

497

498

499

Pulse by Steve Reich
© Copyright 2015 by Hendon Music, Inc. a Boosey & Hawkes Company.
Reprinted by Permission of Boosey & Hawkes, Inc.

The phased pattern emerges five times in flute 1 and one less instance for each subsequent entrance (order flute 1, 2, clarinet 1, and 2). A second phasing section appears immediately after the fifth iteration of flute 1's phasing fragment and produces an A~aBb canon (see example 9). The two flutes are in an octave canon playing the same melody except for the first note.

Example 9: Section 2, M4, woodwind phasing reduction, mm. 495-501.

The musical score shows four staves: Fl. 1, Fl. 2, Cl. 1, and Cl. 2. The key signature has one sharp (F#) and the time signature is 4/4. The score is marked with 'A' and 'B' to indicate specific phasing sections. The flute parts play a melody that is an octave apart from each other, while the clarinet parts play a different melody.

Pulse by Steve Reich

© Copyright 2015 by Hendon Music, Inc. a Boosey & Hawkes Company.

Reprinted by Permission of Boosey & Hawkes, Inc.

After the last phasing section, the rhythmic intricacies played by the instruments involved dissipate into long-held notes, joining the instrumental drones of the movement (second violins and bottom divisi of the violas). From a rhythmic standpoint, the piano plays repetitive cluster chords and remains in a stable pulse, with the electric bass, for the entire movement (see example 10). The latter participates in the phasing by playing four different, chromatic, and repetitive passages that, similarly to the treatment of the woodwinds and strings, repeat fewer and fewer times.

Example 10: Section 2, M4, pulse patterns, mm. 483-486 (pattern 1 = 5 times), mm. 494-496 (pattern 2 = 3 times), mm.509-511 (pattern 3 = 2 times), and mm. 515-517 (pattern 4 = 1 time + 2 modified repetitions).

The image displays three systems of musical notation for the piece 'Pulse' by Steve Reich. Each system consists of a piano part (Pno.) and an electric bass part (Elec. Bass). The piano part is written on two staves, showing a dense, chromatic texture with many beamed notes. The electric bass part is written on a single staff, showing a rhythmic, pulse-like pattern with some phrasing brackets. The key signature is one sharp (F#) and the time signature is 4/4.

Pulse by Steve Reich

© Copyright 2015 by Hendon Music, Inc. a Boosey & Hawkes Company.
Reprinted by Permission of Boosey & Hawkes, Inc.

This is the densest movement of Section 2 as it is very chromatic and employs phasing. Its formal and hermeneutic significance appears in further sections. For now, the density, paired themes, phasing, and chromaticism are notions that differentiate it from previous movements and the relationship between Section 1 and Section 2 remains, although Reich entirely distorts the melody with the phasing treatment of the woodwinds and strings.

Thus far, I explained that Section 1 represents the first era of composition while Section 2 reproduces elements of the second era. In the first period, Reich's focus was phasing, melodic development, counterpoint/canons, gradual augmentations, and block additive processes. The interest in phasing was temporary as this inclination developed, shortly thereafter, into the manipulation of extended melodic lines with the use of augmentation and diminution instead of constant short repetitions. From *Music for 18 Musicians*, Reich experimented with longer melodies, the use of an arch form aided by the delimitation of chord cycles, and perceptibly expanding motives. These long melodic lines appear immediately in Section 1 of *Pulse*. Stemming from the first era of composition, Reich's musical ideal, audible melodic lines, occurs in Section 1 as the canonic treatment remains standard and the doubled melodies are not skewed by an overly dense texture. In other words, these melodic lines are distinct and their development revolves around doubling and canons. However, how do we reconcile this argumentation with the use of phasing apparent in M4 of Section 2? When evaluating all the content of this movement, the phasing elements only densify the rhythmic, melodic, and timbral texture, as well as aid the creation of an arch form. In the first era, Reich employed phasing as a tool for exploring melodic material in limited instrumentation which guided the progression of an entire piece. In M4 of Section 2 however, this melodic manipulation resembles Reich's phasing method seen in the second era of composition with the *Counterpoint Series* (longer melodies), *Duet* (unison canons), and *Nagoya Marimbas* (minimal repetitions), but also distinguishes itself from the mix by combining different timbres into the phasing process (woodwinds, strings, and electric bass). In other words, Section 1 focuses on Reich's prior interests in melodic clarity, while Section 2 develops rather complex melodic interactions, phasing being one of the techniques employed to create density in the rhythmic, melodic, and timbral texture.

The Emergence of an Arch Form through Melodic Treatment

Returning to movement comparisons, M5 of Section 1 employs once more two themes (flute 1 and clarinet 1) that this time develop into an A~a1a followed by an A~a1ab canon (see example 11). In Section 2, M5 begins with a completely disparate melody which differs from the previously accounted intersectional relationship. After the thematic introduction where flute 1 and clarinet 1 double the A theme and clarinet 2 presents the B theme, the flutes and clarinets enter in an Aaab canon followed by ABAB unison. The movement completes with the first treatment: Aaab. However, the two themes (A/B) in first canon differ from the ones in the subsequent unison and final canonic display. The melodies of the latter two are identical (see example 12). Nonetheless, I label both melodies as A's and B's because when compared, both have the same direction and similar rhythms. The biggest change in writing appears in the interval expansions. Thus, Reich simply develops and broadens the primary A and B. The movement also contains less of a dense texture, but remains considerably involved with the canons, cycles, and piano rhythm. A discussion on cycles appears in the formal section.

Example 11: Section 1, M5, woodwind reduction, mm. 154-177. The upbeat (m. 153) contains the first eighth-note of the flute theme (F#) and the first eighth-note of the clarinet theme (C#).

The image shows a woodwind reduction for measures 154-177. It consists of four staves: Fl. 1, Fl. 2, Cl. 1, and Cl. 2. The key signature is two sharps (F# and C#). A box labeled 'V' is positioned above the first staff at measure 154. Flute 1 and Clarinet 1 play a melodic line starting with an eighth note, while Flute 2 and Clarinet 2 are silent.

161 163

Fl. 1
Fl. 2
Cl. 1
Cl. 2

A
Inverted melody
A1
Theme continuation

167

Fl. 1
Fl. 2
Cl. 1
Cl. 2

A

B

172

Fl. 1
Fl. 2
Cl. 1
Cl. 2

A1
A

Pulse by Steve Reich

© Copyright 2015 by Hendon Music, Inc. a Boosey & Hawkes Company.
Reprinted by Permission of Boosey & Hawkes, Inc.

Example 12: Section 2, M5, woodwinds reduction, mm. 545-552 (entrance of first Aaab), mm. 560-568 (ending of previous canon and entrance of ABAB unison), and mm. 587-595 (entrance of last Aaab).

The musical score is presented in three systems, each with four staves (Fl. 1, Fl. 2, Cl. 1, Cl. 2). The key signature is G major (one sharp) and the time signature is 4/4. The first system (mm. 545-552) shows the entrance of the first Aaab. The second system (mm. 560-568) shows the ending of the previous canon and the entrance of the ABAB unison. The third system (mm. 587-595) shows the entrance of the last Aaab. Vertical lines labeled 'A' and 'B' indicate the start and end of musical phrases. A rehearsal mark '560' is present at the beginning of the second system.

Pulse by Steve Reich

© Copyright 2015 by Hendon Music, Inc. a Boosey & Hawkes Company.

Reprinted by Permission of Boosey & Hawkes, Inc.

By comparing these movements, it is apparent, simply by looking at the relationship between the melodies given to the woodwinds, that Section 2 continues to densify the melodic interactions. Other elements arise in the formal section.

M6 and M7 in both sections, remain fairly stable and similar, thus, no extensive description is necessary for understanding their procedures. In Section 1, M6 presents once more melodic harmonizations (flute 1 and clarinet 2) and canons (AaBb as well as AaBa1), but begins to display calmer rhythmic and harmonic textures. In Section 2, M6 similarly shows a lighter ambiance because of the higher presence of long held notes. All the strings double the woodwinds, thus, the drone-like quality of the sustained melodies begins to replace the dense texture present throughout Section 2. In the same light, the piano disappears leaving only the rhythmic stability of the electric bass pulse. Other elements that pertain to the establishment of an arch form (see formal section) contribute to the toned-down atmosphere. M7 of Section 1 continues with the typical melodic harmonizations, establishment of a lighter texture, and canonic treatment (AaBb). Section 2's M7 incorporates fragmented A and B themes in all four woodwinds (one thematic fragment ends and another instrument completes the theme) and the texture again continues to loosen with the violas primarily contributing to the drone sounds. For an example of the melodic similarities between the two movements please see appendix G.

As we transition from Section 1 to Section 2, the augmentation process emerges when comparing the melodies of different sections. In *The Desert Music*, melodic augmentation appears as a primary technique throughout the work.⁶ These augmentation canons also re-emerge in *Proverb*. Even the doubling technique (double instruments of different timbres to alter the color

⁶ More similarities between *Pulse* and *The Desert Music* appear in the formal section.

of the melodies) seen in *Tehillim* and the interchanging of chord sonorities between instruments seen in *Three Movements* reappear in Section 2 of *Pulse*. This materializes in the expanded string section doubling of the woodwinds, the chromatic entrances heard in the electric bass that help color and emphasize these two instrumental groups, and the completion of melodies and chords by different instruments. *Variations for Vibes, Pianos, and Strings* is another work of the second era that inspired a few elements deciphered in Section 2 of *Pulse*. Not only does this previous piece contain a constant pulse, but it also gradually presents more melodic and harmonic material just as Section 2 densifies the overall melodic, harmonic, and rhythmic texture. Also, Reich continued to experiment with instrumentation and timbre in the second era which reemerges in Section 2 through the expanded instrumental involvement in the melodic and harmonic material. Lastly, canonic treatment persists in Reich's music while he complexifies the contrapuntal processes in works like *Know What is Above You*, *Sextet*, *The Four Sections*, etc., and this technique reemerges in Section 2 of *Pulse*, once again, with the densification of melodic material.

After establishing the differences between Section 1's and Section 2's M4 to M7, it is even more apparent how Reich creates higher density in Section 2. Also, two arch forms begin to appear. This piece combines Reich's compositional processes and the sections of the work serve as stepping stones representing the composer's progression through his stylistic eras. Elements of the *Counterpoint Series* and *Sextet* (among other works in this period) appear in the formal section as these pieces influence the instrumentation and global form of *Pulse*. Accordingly, this evaluation of *Pulse*'s relationship to Reich's periods of composition demonstrates that the work as a whole blends perfectly with the style of the third period, and that a clear progression exists between Section 1's elements, pertaining to the first era of composition, and Section 2's appropriation of techniques characteristic of the second era. Section 3 of *Pulse* contains only 1 movement, thus, not

offering enough elements to propose connections with previous repertoire, but the inner details have a significant impact on the form. A discussion on this section's input thusly emerges in the following analysis.

Chapter 3: Formal and Instrumentation Analysis

Many of the components presented in the previous analysis contribute to an understanding of the formal structure of *Pulse*. The work's formal properties emerge by finding the employed techniques' correlating factors. This last chapter uncovers Reich's use of cycles, and borrows the notions from the comparative analysis to establish a global form for *Pulse*. The separation of stylistic sections ties into the creation of *Pulse*'s global form: the entire work matches the stylistic criteria of the third period, the first section represents the first period of composition, the second section alludes to the second period, and the third allows the work to come full circle in a short yet effective conclusion returning to a stable pulse. This discussion on Reich's style evolution and how it can be found in the formal organization of *Pulse* appears within the analytical elaboration below.

Analysis

In the first era of Reich's compositional output, he demonstrated an interest in goal-directed harmony and an expansion in texture and timbre. In following eras, Debussian sonorities and jazz chords replaced this previous preoccupation. Reich's use of 7ths, 9ths, and 11ths encompassed the sound of his later works and these ambient harmonies appear once more in *Pulse*. The strings and woodwinds in Section 2, as well as the chords in the piano, help to achieve these sonorities. The movements progress steadily through these textures, combining the drone-like quality of the strings and the melodic direction of the woodwinds. Similar elements present themselves in prior works. One such work is *Octet*:

Form and texture evolve from three strands, two of which are present throughout: a propelling canon-ostinato in the pianos [in *Pulse*, woodwinds], and a drone effect in the strings. Various

melodic increments enter at different times creating a third strand either distinct from the rest of the texture or doubling parts completely or partially. [...] Reich contrasts this very active strand with a sustained drone effect in the strings. This strand is produced in two ways - what is referred to here as a drone-canon [...] and drone-ostinato (Heisinger n.d.).

In *Pulse*, the drone-canons appear in the relationship between the numerous canons in the woodwinds and the drones in the strings. Like in *Octet*, the form in *Pulse* emerges through the understanding of these canons and drones. The drone-ostinatos, referred to as cycles in this analysis, usually occur in the second violins, violas, and electric bass. However, in Section 2, the woodwinds collaborate with their augmented and sustained melodies. In other words, the cycles and the canons produce a formal direction in the movements of this work. Rhythm and pulse also influence these cycles. This is reminiscent of the form in *The Desert Music* because of the pulse interactions between movements that help to establish an arch (see Chapter 1, Second Period). In *Pulse*, the rhythmic fluctuations in the piano (stable pulse and paradiddle) help to bring about a rise and fall in density. In the subsection below, I evaluate these relationships between cycles, drones, and pulse within the work, to demonstrate the presence of an arch form.

Cycles, Drones, and Melodic Treatment for the Creation of Form

The first approach of this analysis evaluates the relationship between melodic treatment and instrumental doubling. Please refer to appendix H that depicts the melodic/doubling fundamentals of each movement. As discussed at the beginning of the comparative section, the direction of the original melodies in *Pulse* create an arch form: steady climb, climax, descent. This arch form, however, also applies to the larger sections. In both Section 1 and Section 2, the techniques employed in M4 and M5 become more complex while Section 3's single movement creates an arch form through its melodic direction. In Section 1, the melodic presentations reach their peak in those movements with the addition of two-themed canons. The subsequent

movements still employ two themes, but other factors addressed shortly help to gradually calm the ambiance. In Section 2, the melody focuses on developing the themes of Section 1 and reaches a climax with the phasing and chromaticism of M4, and the disparate themes and melodic development of M5. Once more, Reich gradually dissipates the texture in M6 and M7. The general differences in melodic manipulation when comparing the movements within a section, and the distinct deviation from the intersectional norm of melodic appropriation and development suggest a double-arch form (each section creates its own arch) influenced by the densification of melodic material.

For the second approach, the cycles created by the piano, drones and/or electric bass, as well as the piano chord expansions or interplay between steady rhythms and paradiddles contribute to the discovery of form. The piano entrances and alterations merge with the appearances of the drones and electric bass which are themselves directed by the melodies. In other words, all the instruments in this work interconnect continuously making the exploration of form and cycles somewhat transparent despite the interweaving complexity of the work. Please refer to appendix I that outlines the progression of cycles and rhythmic elements. Before discussing the relationship between cycles and form, it is important to spend a little time grasping how Reich treats these successions in *Pulse*. In Section 1, only M2 to M7 employ cycles. Specifically, M2 involves the drones (violas) and electric bass for a total of three cycles (see example 13). In all the following examples, the score reduction includes only the instruments that take part in the procedures.

Example 13: Section 1, M2, cycle reduction, mm. 50-81.

The image displays a musical score for 'Pulse' by Steve Reich, specifically Section 1, M2, cycle reduction, measures 50-81. The score is arranged in four systems, each containing two staves: Electric Bass (Elec. Bass) and Viola (Vla.).

- System 1 (Cycle 1):** The Elec. Bass staff shows a rhythmic pattern of eighth notes. The Vla. staff shows a melodic line with long, sustained notes. A bracket labeled 'Cycle 1' spans the first two measures of this system.
- System 2 (Cycle 2):** Similar to Cycle 1, but the first two notes of the Viola part are modified. A bracket labeled 'Cycle 2' spans the first two measures.
- System 3 (Cycle 3):** The Elec. Bass part is stable and repeats the pattern from Cycle 1. The Viola part repeats the pattern from Cycle 1. A bracket labeled 'Cycle 3' spans the first two measures.
- System 4:** This system continues the patterns established in the previous cycles, showing further repetition of the Elec. Bass and Viola parts.

Pulse by Steve Reich
 © Copyright 2015 by Hendon Music, Inc. a Boosey & Hawkes Company.
 Reprinted by Permission of Boosey & Hawkes, Inc.

In the electric bass, the repetition is stable and the third cycle only slightly extends the content. In the violas however, the third cycle repeats the first with slight modifications while the second cycle changes the first two notes, but keeps the same durational length of the first. Rhythmically, not much involvement appears since the piano pulses stably and holds the same

chord throughout the entire movement. M3 also contains three cycles in the pulsing electric bass and lower drones (see example 14), this time expanding the instrumental engagement by involving two string sections, violas and second violins. Along with the added instrumentation, the movement also includes the piano's changing rhythm as a contributor for delimitating cyclic treatments.

Example 14: Section 1, M3, first cycle and rhythmic reduction, mm. 82-88.

Pulse by Steve Reich

© Copyright 2015 by Hendon Music, Inc. a Boosey & Hawkes Company.
Reprinted by Permission of Boosey & Hawkes, Inc.

The second cycle begins the same way, however, while retaining the original rhythm, the string drones progressively play different notes that are only a short interval distance from the originals. The piano chords that begin with a paradiddle rhythm, as shown in the previous example, return to a stable pulse for the second cycle, but reintroduce paradiddles shortly thereafter. The following example reproduces the middle of the second cycle (compare notation with previous example) in order to show the piano's rhythmic switch. The addition of the first violins' canonic melody contextualizes the cycles as a part of the melodic progressions.

Example 15: Section 1, M3, second cycle, Vln.1, and rhythmic reduction, mm. 98-104.

Pulse by Steve Reich

© Copyright 2015 by Hendon Music, Inc. a Boosey & Hawkes Company.
Reprinted by Permission of Boosey & Hawkes, Inc.

The last cycle in this movement, occurring at the Aaa1a2 canonic entrance, serves as an expansion. The piano returns to a steady rhythm for the rest of the movement, the electric bass attempts the reoccurring pattern a note higher, and the drones hold different notes with the same durational length. As mentioned previously, the cycles of each movement interact with the canonic entrances and overall melodic treatment of the woodwinds and strings. The manipulation of different instruments for the creation of these cycles persists similarly in the subsequent movements of the section. The previous detailed explanation of Reich's cycle usage serves as an indicator of the treatments in each movement.

The only particularity is M5 of Section 2 as it contains two doubled cycles in the drones (second violins and violas): Cycle 1 (2x) and Cycle 2 (2x). The piano once more goes back and forth between rhythmic stability and density. Without the presence of the electric bass, this is the first and only movement that does not contain a stable pulse throughout (either piano or electric bass execution). In the first cycle, the piano pursues a paradiddle rhythm and in the second, it proceeds from rhythmic to stable pulse. The strings simply repeat the same notes corresponding to each cycle (see appendix J for examples).

The structure and instrumentation of these cycles and the rhythm of the piano help to accentuate the arch form of each section. On that note, before discussing the creation of form, there are some interesting affinities worth addressing between *Pulse* and the *Counterpoint Series*.

Pulse and the Counterpoint Series

The pulsating elements as well as the specific choice of instrumentation in *Pulse* recall the *Counterpoint Series* where Reich developed melodies, motives, and canons. This series for solo instruments focuses primarily on counterpoint/canons and contains a strong pulsing element. As mentioned previously, *Vermont Counterpoint*, for flute, expands on textural development and canonic relationships. This is how Reich treats the flutes in *Pulse*. *New York Counterpoint*, for clarinet, uses disappearing and reappearing pulsating chords for the sake of their color and sonorities, reflecting the jazz genre and Debussy. In the case of *Pulse*, the treatment of these ambient chords (through cycles) as well as melody and rhythm contribute to the understanding of form. Although, the clarinet in *Pulse* does not play pulsating chords, the strings, electric bass, and piano help to sound out the jazz “chords” and Debussian sonorities while the woodwinds produce canonic melodies which gradually generate a dense texture. These canons, cycles, and pulses show the form-creating interactions between rhythm and melody as seen in *New York Counterpoint* and

other works: “*Six Pianos*, *New York Counterpoint*, and *The Four Sections* demonstrate how form-creating process of pitch and rhythm result from the specific manner in which repeated patterns are built up, varied, and combined polyphonically” (Roeder 2003, 275). In *Pulse*, the repeated patterns reemerge through the elements analyzed above.

Electric Counterpoint, written for electric guitar, incorporates once more jazz sonorities, pulsing, interweaving melodies, and rhythmic focus. When comparing this work to others, Heisinger (1991) noticed that “these compositional techniques, also found in *Octet* (1979), generate a rich texture of cross-rhythms and melodic fragments characteristic of Reich’s repetitive style” (111). Reich applies all of these elements to *Pulse*. The electric bass and the piano generate the pulse, rhythmic fluctuations, and sonorities. The woodwinds and the strings create the interweaving melodic and rhythmic fragments. Lastly, in *Cello Counterpoint*, Reich explores a freer structure, harmonic cycles, and rapid rhythms (Reich 2003). In *Pulse*, the strings display melodic cycles, rapid rhythms (during phasing and doubling), and a freedom in structure as thematic notes regularly begin on the downbeat (in the previous movement). The electric bass and the piano chords also persist without pause and play rapid rhythmic progressions which contributes to the continuous direction of the work.


When targeting instrumentation, it is interesting to note that the instruments used for the *Counterpoint Series* dominate the score in *Pulse*. Aside from the cello which is replaced by other strings, the flute, clarinet, and electric bass are the primary instruments. The piano contributes to the score as a percussive and harmonic instrument which is a typical pianistic treatment for Reich as it appears in many of his works stemming from all three compositional periods.

The Arch Form

In the image below, the placement of the movements allows the reader to better grasp the arch form implication in *Pulse*. In Section 1, this relationship emerges (please refer to appendix I for clarification):

Image 1:

M1: Chord expansion and S. M2: 3C and S. M3: 3C and P+ [S+P] + S. M4: 2C and S+P.
M5: 3C and S. M6: 3C and V. M7: 2C and S.

M1 M2 M3 M4 M5 M6 M7


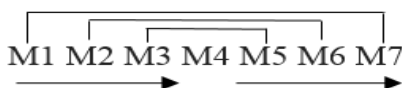
C: Cycles
S: Stable Pulse
P: Paradiddle
V: Void (no piano)

M1 serves as an introduction while the rest of the movements seem to project towards the ones containing only 2 cycles. The piano's rhythmic experimentation seen in M3 propels the rhythm into the paradiddle/stable pulse of M4. The subsequent movements contain either a stable pulse or no pianistic involvement, accentuating the importance of the rhythmic interplay in M4. Also, M5 and M6 employ the cycles in sparser string divisi (bottom second violins and top violas divisi), with the electric bass reappearing in M6, while M7 returns to only electric bass and violas. This shows a gradual dissipation of the number of instruments used for sustained cycles. Thus, M4 and M7 represent unique movements in the form. When comparing these elements to the melodic treatment of each movement (refer to appendix H), a similar progression is apparent. M1 to M3 explore one themed canon (A) within the four woodwinds while M4 presents for the first time the second theme (B) that results in an AaBb canon. From that point M5 and M6 explore different canons using both themes and M7 returns to AaBb. The difference between M4 and M7 that

suggests an arch form is that the movements leading up to M4 build in rhythmic and melodic tension while M5 to M7 diminish the instrumental, melodic, and rhythmic involvement. By superimposing the cycles and rhythms of the movements, the formal direction becomes apparent and the addition of other musical elements helps to define the form. A similar relationship appears in Section 2. The following image omits the rhythmic elements because of their complexities:

Image 2:

M1: 3C. M2: 0C. M3: Piano interplay.
 M4: P.
 M7: 2C. M6: 0C. M5: 2 (x2)C.



C: Cycles
 P: Phasing

In this section, the relationship between movements depends more on technique complexity than the number of cycles (refer to appendix H and I). The suggested direction seems appropriate as M4, once again, is the center towards which the music builds and from which the music calms. There is a strong relationship between movements, as demonstrated by the brackets, that isolates once more M4 in the center of it all. M1 and M7 employ normal cycles, M2 and M6 abstain, and M3 and M5 have particular treatments that both primarily involve the piano. Also, M4 stands alone because of its manipulation of instrumentation. All the movements in Section 2 exploit the violas for the drones except M4, that only utilizes its bottom divisi since the top participates in the phasing. To compensate, M4 involves the entire second violins section instead. Unlike other movements, M4 has an equal distribution in the strings, half playing the melody and half sustaining the drone-like ambiance. The second violins, as well as the entire violas section,

reappear in M5 and M6 for the drone responsibilities, while M7, like M1 through M3, only employs the violas section.

The piano rhythm in M1 and M2 builds to M3 that is, once more, the densest movement in terms of rhythm and a form of rhythmic experimentation that propels into M4. In the latter movement, the piano abstains from paradiddle rhythms, going from stable pulse to silence to stable pulse. This compositional choice probably stems from the already thick rhythmic texture created by all the phasing instruments. Thus, this M4 is the most rhythmically compact because of the melodic treatment rather than the piano chords. Unsurprisingly, the subsequent movements reinterpret the piano rhythms and gradually return to stability.

ABCDCBA

By evaluating all the elements discussed above, in both sections, M3 serves as a rhythmic buildup to the climaxing M4 which is followed by M5 that reinterprets much of the content and begins the descent to stability and peaceful textures. The analysis above supports the argument that Reich utilizes the ABCDCBA arch in the first two sections, a form previously encountered in many of his works. Thus far, the analysis introduced little content on Section 3 because of the lack of musical material and its connection with only two movements of the previous sections. Section 3's first and only movement augments the main melodic material of the previous M1's and contains the largest drone involvement utilizing violas, second violins, and first violins' bottom divisi. It returns to calm and simplicity, that is emphasized by the drones being played by almost all the strings. This movement comes full circle after all the development that occurred throughout the sections. It constitutes a postlude of sorts or a conclusive movement, stretches the content from the beginning, and maintains a stable pulse. This section creates an extended arch in the melodic material, as present in all the primary melodies in the piece, that reminds the listener of the first

melody heard in M1 of Section 1. Together, the three sections produce three isolated waves that globally begin with simplicity, densify through the elements discussed above, and return to a slow pulsing pace.

All the mentioned elements contribute to the triple arch form of *Pulse*. The single arch form, originally introduced in *Music for 18 Musicians* (ABCDCBA), presents itself in many following works. In *Pulse*'s first two sections, the D's or M4's are again the most climactic movements and the following movements gradually decrease in intensity. Section 3 returns to a simple pulse, in addition to the long-held notes in the strings, and the melodic material creates the third and final arch. These three arches are parts of a larger formal direction, reminiscent of *The Desert Music*. The latter work begins with a calm and steady pulse, employs augmentation throughout, and returns to a steady pulse for the ending. *City Life* again uses this large arch form and gradually densifies like Section 2 of *Pulse*. With *Sextet*, Reich creates the arch form (ABCBA) with harmony or a cycle of chords, similar to *Music for 18 Musicians*, *Tehillim*, and *The Desert Music* (Mathey 2004, 117). In *Pulse*, however, harmony does not impact the form since, at this point of his compositional career, Reich prefers to work with ambiance rather than tonality and harmonic direction. Nonetheless, cycles, as seen through a variety of instrumentation, do influence the creation of form.

Arch Form within an Arch Form

Thus, three levels of this arch form appear in *Pulse*. Firstly, each new melody creates a repetitive rise and fall. Secondly, each Section contains an arch either through the relationship discussed above between the 7 movements or, as is the case for Section 3, through the elongated melodic material. Thirdly, the entire work begins with simpler textures, densifies and expands, and gradually returns to a steady pulse. In other words, *Pulse* is a series of arches (in the melodic

material) that are contained in three arch forms (characterized by the 3 Sections), which are a part of an even larger arch form (the 15 movements).

It is apparent that Reich's recent piece employs his common arch form and many previously attempted form creating elements. He borrows the general form, discovered in *Music for 18 Musicians*, from the first era and the elements to create it from the second era. Overall, the rhythmic interplay, canons, augmentation, cycles, and all other elements mentioned above contribute to the arch forms discovered in *Pulse*.

Conclusion

The fusion of history and analysis demonstrates that *Pulse* is indeed a combination and culmination of Reich's compositional output as seen through the composer's technical and stylistic evolution when approaching form, melody, harmony, and rhythm. The content of this thesis allows for an in-depth understanding of a new musical work by combining the fields of history and analysis while including the perspectives of scholars, composer, and performers. The historical exploration revealed three separate periods of composition, each stemming from one another as Reich developed as a composer. Nonetheless, all three contain distinctive evolutive factors that contribute to a larger understanding of Reich's output.

Pulse fits into the third era of composition as it is a grand synthesis of Reich's techniques and borrows stylistic elements from other genres. The triple arch form represents a culmination of Reich's formal practice, with the arch in the melodic direction of each movement and Section 3, the arch forms discover for Section 1 and 2, as well as the large arch form that encompasses the rise and fall in rhythmic, melodic, and harmonic density of the entire work. The simplistic development of Section 1 shows how a composer begins on his journey, with the basics. It depicts Reich's first era of compositional output where melodic clarity, canonic treatments, and overall audibility of structure were the primary concern. Section 2 symbolizes the development of a composer, taking musical material and exploring its possibilities with more complex techniques. Thus, Section 2 embodies the second era of composition with its gradual augmentation in melody, density in texture and rhythm, gradual expansion in chords, and extensive use of varying instrumentation. The last movement (M1 in Section 3), where the musical material thins out, shows a composer's return to calm and simplicity in old age. The ongoing pulse then embodies the composer's living pulse. Could this be Reich's new stylistic direction for his final works? He stated

that he wished to musically “stay put” for a long time, therefore, this inclination could be the introduction of a new style and focus.

The results of this research contribute to the field by offering an outline and separation of Reich's stylistic evolution, as well as an analysis of a new piece not yet addressed in scholarly literature. One of the big strengths of this approach lies in its synthesis of history and analysis for understanding a piece. The possible benefits of this direction are also weaknesses considering the amount of research and analysis it entails, and the focus on a piece completed and performed recently. The opportunity to work on new music certainly contributes to the field of study. However, no direct scholarship exists on the topic and the research must rely on its own efficiency and accuracy to obtain an authentic analysis. Given the tools at my disposal and because I attempted to cover a large piece (over 100 pages), the produced analysis is of course only one interpretation of many possible reflections. The present analysis tackled the entire work in a comparative and structuralist standpoint. The review of literature produced a general grasp of repeated techniques in Reich's music and established their development throughout his career. Finding the links and musical consistencies in the repertoire through the literature created a consistent and relevant regularly applicable analytic focus. The analysis then centered on those chosen techniques and explained the piece's structure and form through this perspective. In other words, the approach is quite global and more detailed elements can appear with a different methodological focus. Nonetheless, considering the work's size, I chose this particular direction as a way to explain the piece in, what I believe to be, the most effective and efficient way.

Ultimately, the goal was to create an analysis that synthesizes the two fields by combining and associating information from isolated literature, deciphering its relationship to other types of sources, creating a global stylistic separation of a composer's musical output, analysing a recent

work based on that previously acquired information, and thus, creating a holistic perspective of the historian and the analyst. The consistencies the research reveals bring clarity to the composer's body of works and suggest an appropriate focus for future analyses.

References

- Betta, Andy. 2016. "Steve Reich, at 80, Keeps Up the Rhythm." *The Wall Street Journal*. October 31. Accessed November 7, 2016. <http://www.wsj.com/articles/steve-reich-celebrates-80th-birthday-with-world-premiere-of-pulse-1477951688>.
- Castanet, Pierre Albert. 2012. "Le Médium Mythologique du Rock'N'Roll et la Musique Contemporaine." *Intersections* 32 (1-2): 83-115.
- Cazé, Antoine. 2010. "Chroni(qu)es New-Yorkaises: *City Life* de Steve Reich." Vers. 7.2. *E-rea [Online]*. March 24. Accessed October 11, 2016. <http://journals.openedition.org/erea/1226>
- Chouvel, Jean-Marc. 2004. "Structural Analysis and Cognitive Activity." *Journal of New Music Research* 33 (1): 19-29.
- Cohn, Richard. 1992. "Transpositional Combination of Beat-Class Sets in Steve Reich's Phase-Shifting Music." *Perspectives of New Music* 30 (2): 146-177.
- Cutts, Paul. 1999. "Ancient and Modern." *Choir & Organ* 7 (5): 43.
- Duker, Philip. 2013. "Resulting Patterns, Palimpsests, and "Pointing Out" the Role of the Listener in Reich's *Drumming*." *Perspectives of New Music* 51 (2): 141-191.
- Gimbel, Allen. 2006. "Reich: *You Are; Cello Counterpoint*." *American Record Guide* (69)1: 175.
- Ginell, Richard S. 2005. "LA Master Chorale: Reich *You Are* (Variations)." *American Record Guide* 68 (2): 45-46.
- Glahn, Denise von. 2003. *The Sounds of Place: Music and the American Cultural Landscape*. Boston: Northeastern University Press.
- Grella, George. 2014. "Old and New Reich Mix in Exhilarating Fashion at Zankel Hall." *New York Classical Review*. October 30. Accessed October 25, 2016. <http://newyorkclassicalreview.com/2014/10/old-and-new-reich-mix-in-exhilarating-fashion-at-zankel-hall/>.
- , 2016. "'Pulse' Premiere Shines Brightly at Steve Reich's Carnegie Birthday Bash." *New York Classical Review*. November 2. Accessed November 7, 2016. <http://newyorkclassicalreview.com/2016/11/pulse-premiere-shines-brightly-at-steve-reichs-carnegie-birthday-bash/>.
- Hartenberger, Russell. 2013. "Clapping Music: a Performer's Perspective." In *The Ashgate Research Companion to Minimalist and PostMinimalist Music*, edited by Kyle Gann, Keith Potter and Pwyll ap Sion, 371-379. Surrey: Ashgate Publishing Limited.

- Haskins, Rob. 2002. "Triple Quartet; Electric Guitar Phase; Music for Large Ensemble; Tokyo-Vermont Counterpoint." *American Record Guide* 65 (1): 155.
- . 2008. "Reich: *Daniel Variations; Variations for Vibes, Pianos, & Strings*." *American Record Guide* 71 (4): 162.
- . 2010. "Reich: *Double Sextet*." *American Record Guide* 73 (6): 178.
- . 2011. "Reich: *WTC 9/11*." *American Record Guide* 74 (6): 155.
- . 2015. "Reich: *Radio Rewrite; Electric Counterpoint; Piano Counterpoint*." *American Record Guide* 78 (1): 148-149.
- Heisinger, Brent. 1991. "Reviewed Work(s): *Different Trains* by Steven Reich; *Electric Counterpoint* by Steven Reich." *American Music* 10 (1): 111.
- . n.d. *Compositional Devices in Steve Reich's Octet*. Accessed June 26th, 2017. <http://www.ex-tempore.org/heisinger/HEISINGER.htm>
- Horlacher, Gretch. 2000/2001. "Multiple Meters and Metrical Processes in the Music of Steve Reich." *Intégral* 14/15: 265-297.
- Johnson, Timothy A. 1994. "Minimalism: Aesthetic, Style, or Technique?" *The Musical Quarterly* 78 (4): 742-773.
- Kilbey, Paul. 2016. "Listen: Steve Reich on the Universal Power of Music." *Royal Opera House*. November 16. Accessed August 14, 2017. <http://www.roh.org.uk/news/listen-our-species-dances-to-music-steve-reich-on-his-music-dance-and-working-with-wayne-mcgregor>.
- Kim, Rebecca Y. 2000. "From New York to Vermont: Conversation with Steve Reich." *Current Musicology* 67: 345-366.
- Kosman, Joshua. 2010. "Reich Strikes a New Chord with 'Mallet Quartet'." *SFGATE*. January 11. Accessed October 25, 2016. <http://www.sfgate.com/music/article/Reich-strikes-a-new-chord-with-Mallet-Quartet-3203074.php>.
- . 2017. "Reich's Recent Work not the Same Old." *The San Francisco Chronicle*. January 31. Accessed August 14, 2017. <https://www.pressreader.com/usa/san-francisco-chronicle/20170131/282406989076872>.
- Kyle Gann, Keith Potter, and Pwyll ap Sion. 2013. "Introduction: Experimental, Minimalist, Postminimalist? Origins, Definitions, Communities." In *The Ashgate Research Companion to Minimalist and PostMinimalist Music*, edited by Kyle Gann, Keith Potter, and Pwyll ap Sion, 1-16. Surrey: Ashgate Publishing Limited.

- Mathey, Marc. 2004. *Steve Reich: un Art de L'Ambiguïté*. Lille: Atelier National de Reproduction des Thèses.
- Reich, Steve. 1996. "My Life with Technology." *Contemporary Music Review* 13 (2): 13-21.
- . 1998. "Texture-Space-Survival." *Perspectives of New Music* 26 (2): 272-280.
- . 2002. *Writings on Music 1965-2000*. New York: Oxford University Press.
- . 2003. "Cello Counterpoint-Composer's Notes." *Boosey & Hawkes*. October 18. Accessed June 24, 2017. <http://www.boosey.com/cr/music/Steve-Reich-Cello-Counterpoint/5459>.
- . 2005. "Variations for Vibes, Pianos, and Strings-Composer's Notes." *Boosey & Hawkes*. Accessed October 26, 2016. <http://www.boosey.com/cr/music/Steve-Reich-Variations-for-Vibes-Pianos-and-Strings/26525>.
- . 2015. "Pulse-Composer's Notes." *Boosey & Hawkes*. Accessed August 14, 2017. <http://www.boosey.com/cr/music/Steve-Reich-Pulse/57396>.
- Roeder, John. 2003. "Beat-Class Modulation in Steve Reich's Music." *Music Theory Spectrum* 25 (2): 275.
- Schwarz, Robert K. 1980. "Steve Reich: Music as a Gradual Process Part 1." *Perspectives of New Music* 19 (1/2): 373-392.
- . 1981-1982. "Steve Reich: Music as a Gradual Process Part II." *Perspectives of New Music* 20 (1/2): 225-286.
- . 1990. "Process vs. Intuition in the Recent Works of Steve Reich and John Adams." *American Music* 8 (3): 245-273.
- . 1996. *Minimalists*. New York: Phaidon.
- Warburton, Dan. 1988. "A Working Terminology for Minimal Music." *Intégral* 2: 135-159.

Appendices

Appendix A1

First Period	Phasing or melodic fragments	Extended Melodies	Canonic Sub-pairing	Similar Timbres	Varied Timbres	Gradual augmentation*	Block add. process*	Textural add. process*	Harmony as structure*	Form
Piano Phase	X			X						
Violin Phase	X			X						
Four Organs				X		X				
Phase Patterns	X			X						
Drumming	X			X			X	X		X
Clapping Music	X			X			X			
Music for Pieces of Wood	X			X		X	X	X		
Six Pianos				X		X	X		X	
Music for Mallet Instruments, Voices, and Organ	X		X		X	X	X		X	
Music for 18 Musicians	X	X			X	X	X		X	X
Music for Large Ensemble	X	X			X	X	X		X	X
Octet	X	X			X	X	X		X	X
Variations for Winds, Strings, and Keyboards		X	X		X		X		X	

*When referring to augmentation processes, it includes diminution as a potential technique. When referring to additive processes, it includes subtractive as a potential technique. Harmony as structure can include the use of chords cycles.

Appendix A2

Second Period	<i>Video</i>	<i>Speech melodies</i>	Tape or sampling	Phasing or melodic frag.	Extended Melodies	Canonic Sub-pairing	Form	Harmony as structure	Textural add. process	Gradual aug.	Metric or rhythmic*
Tehillim		X			X	X	X	X			
Different Trains		X	X	X			X				
The Cave	X	X	X	X			X				
City Life		X	X	X		X	X	X	X		X
Proverb		X			X	X				X	
Three Tales	X	X	X	X			X				
Know What Is Above You		X			X	X					
You Are (Variations)		X		X							
Daniel Variations		X			X			X		X	
The Desert Music		X		X			X	X			X
Vermont Counterpoint			X	X	X	X	X		X		X
Electric Counterpoint			X	X	X	X	X	X	X		X
New York Counterpoint			X	X		X	X	X	X		X
Cello Counterpoint			X	X	X	X		X	X		
Sextet				X		X	X	X			X
Three Movements				X	X	X	X	X	X		X
The Four Sections				X	X	X	X	X	X		X
Duet				X	X	X					X
Nagoya Marimbas				X	X	X					X
Triple Quartet					X	X	X	X			X
Dance Patterns				X	X			X			
For Strings	No recordings or written content available for this piece.										
Variations for Vibes				X	X	X	X	X	X		X

*The table does not consider the elements that occur all the time (like having a steady pulse). This box includes all possible modifications of rhythm that can contribute to metrical ambiguity (block additive process, metric modulations i.e.).

Appendix A3

Third Period	<i>Speech melodies</i>	Tape or sampling	Phasing or melodic frag.	Extended Melodies	Canonic Sub-pairing	Form	Harmony as structure	Influence of external genres	Stop-Action melodies	Metric or rhythmic ambiguity*
Double Sextet		X	X	X	X	X	X			X
Mallet Quartet			X	X		X	X	X		X
Quartet				X		X	X		X	
2x5		X	X					X		
WTC 9/11	X	X				X	X		X	X
Finishing the Hat				X			X	X		X
Radio Rewrite			X	X		X	X	X		X
Runner				X	X	X	X			X
Pulse			X	X	X	X	X	X		

*Can include new addition: lengthy notes that create an ambiguity in tempo.

Musical score for Pulse by Steve Reich, measures 34-37. The score is for four woodwind parts: Flute 1 (Fl. 1), Flute 2 (Fl. 2), Clarinet 1 (Cl. 1), and Clarinet 2 (Cl. 2). The key signature is one sharp (F#) and the time signature is 4/4. Measure 37 is marked with a box containing the number 37. The score includes dynamic markings *mp* and *A* (Allegretto).

Pulse by Steve Reich
© Copyright 2015 by Hendon Music, Inc. a Boosey & Hawkes Company.
Reprinted by Permission of Boosey & Hawkes, Inc.

Appendix C

Section 1, M1, woodwind and pulse reduction, mm. 1, mm. 13-14, mm. 25-27, and mm. 34-38.

Flute 1 *mp*

Flute 2

B♭ Clarinet 1 *mp*

B♭ Clarinet 2

Piano

Fl. 1 *mp*

Fl. 2 *mp*

Cl. 1

Cl. 2

Pno. *p*

Elec. Bass *p*

Fl. 1

Fl. 2

Cl. 1

Cl. 2 *mp*

Pno.

Elec. Bass

Pulse by Steve Reich
 © Copyright 2015 by Hendon Music, Inc. a Boosey & Hawkes Company.
 Reprinted by Permission of Boosey & Hawkes, Inc.

Appendix D

Section 1, M1, drone reduction, mm. 1-12.

Musical score for Section 1, M1, drone reduction, mm. 1-12. The score is for Violins 2 and Violas. The key signature is two sharps (F# and C#), and the time signature is 3/4. The music consists of sustained chords in the Violins 2 part and a single note in the Violas part, both marked *mp* (mezzo-piano).

Pulse by Steve Reich
© Copyright 2015 by Hendon Music, Inc. a Boosey & Hawkes Company.
Reprinted by Permission of Boosey & Hawkes, Inc.

Section 2, M1, string reduction, mm. 277-298.

Musical score for Section 2, M1, string reduction, mm. 277-298. The score is for Violin 1 (Vln. 1), Violin 2 (Vln. 2), and Viola (Vla.). The key signature is two sharps (F# and C#), and the time signature is 3/4. The music features sustained chords in the Viola part and melodic lines in the Violin parts. The Violin 2 part has a *mf* (mezzo-forte) dynamic marking. A circled note is visible in the Violin 1 part.

The image shows a musical score for the piece "Pulse" by Steve Reich. It consists of three staves: Violin 1 (Vln. 1), Violin 2 (Vln. 2), and Viola (Vla.). The music is written in a key signature of two sharps (D major) and a 4/4 time signature. The score is divided into measures by vertical bar lines. Several notes and phrases are circled in black, highlighting specific musical elements. In the Vln. 1 staff, a quarter note on G4 in the fourth measure and a quarter note on A4 in the fifth measure are circled. In the Vln. 2 staff, a quarter note on G4 in the fourth measure and a quarter note on A4 in the fifth measure are circled. In the Vla. staff, a quarter note on G4 in the fourth measure and a quarter note on A4 in the fifth measure are circled. The score is presented in a clean, black-and-white format.

Pulse by Steve Reich

© Copyright 2015 by Hendon Music, Inc. a Boosey & Hawkes Company.
Reprinted by Permission of Boosey & Hawkes, Inc.

Appendix E

Section 1, M1, pulse reduction, mm. 13-33.

Piano (Pno.) part: *p*

Electric Bass (Elec. Bass) part: *p*

Pulse by Steve Reich
© Copyright 2015 by Hendon Music, Inc. a Boosey & Hawkes Company.
Reprinted by Permission of Boosey & Hawkes, Inc.

Section 2, M1, pulse reduction, mm. 277-298.

Piano (Pno.) part: *mf*

Electric Bass (Elec. Bass) part:

The image displays two systems of musical notation for the piece "Pulse" by Steve Reich. Each system consists of a Piano (Pno.) part and an Electric Bass (Elec. Bass) part. The Piano part is written in treble clef with a key signature of one sharp (F#) and a 4/4 time signature. It features a complex, layered texture of chords and melodic lines, with some notes circled in red. The Electric Bass part is written in bass clef with the same key signature and time signature, providing a steady, rhythmic accompaniment. The first system shows the initial measures, while the second system continues the piece with similar textures.

Pulse by Steve Reich

© Copyright 2015 by Hendon Music, Inc. a Boosey & Hawkes Company.

Reprinted by Permission of Boosey & Hawkes, Inc.

Appendix F

Section 1, M4, woodwind reduction, mm. 139-147. The first note of the themes is cut from the example below because of the setup of the sheet music. However, it is visible in the canonic repetitions.

Fl. 1
A

Fl. 2
A

Cl. 1
B

Cl. 2
B

Pulse by Steve Reich

© Copyright 2015 by Hendon Music, Inc. a Boosey & Hawkes Company.
Reprinted by Permission of Boosey & Hawkes, Inc.

Appendix G

Section 1, M7, woodwind reduction, mm. 240-256. The upbeat (m.239) contains the first eighth-note of the flute theme (C#) and the first eighth-note of the clarinet theme (F#).

240 VII

Fl. 1

Fl. 2

Cl. 1

Cl. 2

248

Fl. 1

Fl. 2

Cl. 1

Cl. 2

Pulse by Steve Reich

© Copyright 2015 by Hendon Music, Inc. a Boosey & Hawkes Company.

Reprinted by Permission of Boosey & Hawkes, Inc.

Section 2, M7, woodwind reduction, mm. 689-712. The upbeat (m. 688) contains the first eighth-note of the flute theme (C#) and the first eighth-note of the clarinet theme (F#).

689 **VII**

Fl. 1

Fl. 2

Theme 1

Cl. 1

Cl. 2

Theme 2

698

Fl. 1

Fl. 2

Cl. 1

Cl. 2

705

Fl. 1

Fl. 2

Cl. 1

Cl. 2

Pulse by Steve Reich

© Copyright 2015 by Hendon Music, Inc. a Boosey & Hawkes Company.
Reprinted by Permission of Boosey & Hawkes, Inc.

Appendix H

Table 1: The melodic treatment within all movements.

M	Canon A	Canon A-B	Extended melodies	Phasing	Vln.1 doubling	Vln.2 doubling	Vla. doubling
Section 1							
1	Aa Aaa1 Aaa1a2				Full divisi		
2	Aa Aaa1				Full divisi		
3	Aa Aaa1a2				Full divisi		
4		AaBb			Full divisi		
5		A~a1a A~a1aB			Full divisi		
6		AaBb AaBa1			Full divisi		
7		AaBb			Full divisi		
Section 2							
1			Theme 1		Full divisi	Full divisi	
2	Aaa1a2		Theme 2		Full divisi	Full divisi	
3			Theme 3		Full divisi	Full divisi	
4		Aab1b2 A~aBb	Theme 4 + chromaticism	Phasing	Full divisi		Top divisi
5		Aaab ABAB (unison) Aaab			Full divisi		
6			Theme 6		Full divisi	Full divisi	Full divisi
7			Theme 7		Full divisi	Full divisi	
Section 3							
1			Theme 1		Top divisi		

Appendix I

Table 2: The rhythmic treatment and cycles within all movements.

M	Cycles: piano, electric bass or drones	Drone instruments	Piano: steady rhythm, void, or paradiddle
Section 1			
1	Piano expansion	Vln.2 +Vla.	S
2	3 cycles EB and Vla. drones	Vln.2 +Vla.	S
3	3 cycles EB, Vln.2, and Vla. drones	Vln.2 +Vla.	P+[S+P]+S
4	2 cycles EB, Vln.2, and Vla. drones	Vln.2 +Vla.	S+ P
5	3 cycles in Vln.2 bottom divisi, and Vla. top divisi drones	Vln.2 +Vla.	S
6	3 cycles EB, Vln.2 bottom divisi, and Vla. top divisi drones	Vln.2 +Vla.	V
7	2 cycles EB and Vla. drones	Vln.2 bottom divisi +Vla.	S
Section 2			
1	3 cycles EB and Vla. top divisi drones	Vla.	P + S
2		Vla.	S+V+P
3	Piano interplay	Vla.	S+V+S+P+S+P
4	Phasing in EB and Vla. top divisi	Vln.2+ Vla. bottom divisi	S+V+S
5	2 cycles x2 drones+piano	Vln.2 +Vla.	P+S+P+S
6		Vln.2 +Vla.	V
7	2 cycles EB	Vla.	S
Section 3			
1		Vln.1 bottom divisi+ Vln.2+Vla.	V

Appendix J

Section 2, M5, cycle demonstration, mm. 525-537.

The musical score is presented in two systems, each containing six measures. The key signature is G major (one sharp) and the time signature is 3/4. The instruments are Piano (Pno.), Violin 2 (Vln. 2), and Viola (Vla.).

System 1 (Measures 525-530):

- Piano:** Plays a rhythmic pattern of eighth notes and chords. The melody is in the right hand, and the accompaniment is in the left hand.
- Violin 2:** Plays a sustained chord, marked *mp*. The label "Cycle 1" is placed above the staff.
- Viola:** Plays a sustained chord, marked *mp*.

System 2 (Measures 531-536):

- Piano:** Continues the rhythmic pattern from the first system.
- Violin 2:** Continues the sustained chord, marked *mp*.
- Viola:** Continues the sustained chord, marked *mp*.

Pulse by Steve Reich

© Copyright 2015 by Hendon Music, Inc. a Boosey & Hawkes Company.
Reprinted by Permission of Boosey & Hawkes, Inc.

Section 2, M5, cycle demonstration, mm. 560-577.

Pno.

Vln. 2

Vla.

Cycle 2

Pno.

Vln. 2

Vla.

569

Pulse by Steve Reich
© Copyright 2015 by Hendon Music, Inc. a Boosey & Hawkes Company.
Reprinted by Permission of Boosey & Hawkes, Inc.