Symphony No. 1 and The Development of New Techniques in Contemporary Music Composition

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SYMPHONY NO. 1
AND
THE DEVELOPMENT OF NEW TECHNIQUES IN CONTEMPORARY
MUSIC COMPOSITION

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

in

The School of Music

by
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May 2017
For Mom and Dad

On this earth, there are none better. With all my love, respect, and admiration, thank you.
ACKNOWLEDGEMENTS

I would like to express my sincere thanks to Dr. Dinos Constantinides for his guidance and instruction during this process. His extraordinary gift as a teacher has helped me to become a much better composer. I want to extend my great appreciation to Dr. Robert W. Peck for his exceptional advice and for helping me to better understand neo-Riemannian theory. I would also like to thank Dr. Daniel T. Shanahan for being generous with his time and immense knowledge.

My sincere gratitude is extended to Dr. Lori Bade for her extraordinary guidance. My sincere appreciation is offered to Ms. Clovier Torry for her words of inspiration and also to the Huel D. Perkins Fellowship committee for selecting me as a recipient of such a prestigious award.

I am especially grateful to my parents Fred and Mildred Lacy for their support and many sacrifices throughout the years. A special thanks is offered to Fred Jr., Frank, and David for being great brothers and great friends.

Most importantly, I would like to thank my Lord and Savior Jesus Christ for His many blessings and unmerited grace. All that I am, I owe to Him.
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ABSTRACT

The initial part of this dissertation is a symphony. Symphony No. 1 consists of three movements. Each movement begins with a monumental gesture designed to make a bold and unforgettable statement. Within each movement, there is an interesting array of harmonic and rhythmic schemes. In Symphony No. 1, the diametrically opposed concepts of “simple” and “complex” are featured prominently. These concepts are contrasted thematically, rhythmically, and harmonically.

The next part of this dissertation establishes the existence of certain obstacles facing contemporary composers and the benefits of developing new techniques in composition. The music of György Ligeti and Arvo Pärt are examined in order to explore of the specific techniques used in their compositions. This involves a review of micropolyphony, including aspects of its origin and development. This also involves an examination of the tintinnabuli technique and its role in the music of Arvo Pärt.

The final two sections of this dissertation include the presentation of a new compositional technique. Part of this presentation consists of a synopsis of some neo-Riemannian techniques, including aspects of harmonic dualism and parsimonious voice leading. This is followed by the comparative analysis of a new technique with methods used in established compositional works. The new technique is based on parsimonious voice leading extended to ninth chords and minor eleventh chords. It is also based on two distinct types of motives. The first motive is distinguished from the second in that it does not develop. Conversely, the second motive incorporates various aspects of motivic variation and development. The analyses presented in this section effectively demonstrate
the uniqueness of the new technique as well as its legitimacy as a means of artistic expression and communication.
PART I
SYMPHONY NO. 1
INSTRUMENTATION

Flute 1, 2
Bass Flute
Oboe 1, 2
Clarinet in B♭ 1, 2
Bassoon 1, 2

Horn in F 1, 2, 3, 4
Trumpet in B♭ 1, 2, 3
Trombone 1, 2
Bass Trombone
Tuba

Timpani
Cymbals
Glockenspiel

Harp

Violin I
Violin II
Viola
Violoncello
Double Bass

Score in C
PART II
INNOVATIVE TECHNIQUES IN MODERN COMPOSITION

CHAPTER 1
INTRODUCTION

Evolution is a fundamental component of musical growth; traditional techniques of Western art music include elements of rhythm, chord structure, density, texture, and melodic shape or contour.¹ In twentieth-century music, however, the importance of some of these traditional elements has been diminished greatly.² In recent times, in fact, many composers have gone so far as to treat sound as an afterthought.³

Depending on the part of the world in which it was developed, musical attributes such as pitch, rhythm, and harmony take on a different construct.⁴ According to theorist Robert C. Ehle in The Dilemma of Contemporary Music, Western art music is differentiated from most other cultures in that there is a functional distinction between the composer and the performer. Additionally, he asserts that Western music separates itself from other cultures with regard to scale, harmony, notation, and the institution of the formal concert. He further claims that most non-Western cultures associate music with part of another medium such as dance or theatre, while Western art music is structured in such a fashion of sophistication that it exists solely for the purposes of its own enjoyment.⁵

¹ David Cope, Techniques of the Contemporary Composer (Belmont, CA: Schirmer Books, 1997), xi.
³ Ibid.
⁴ Ibid., 21.
⁵ Ibid.
One of the earliest issues necessary to be set in order for Western music to exist in its current form is music notation. In *The Dilemma of Contemporary Music*, Ehle states that music notation originated around the tenth-century, after which, a great deal of time was spent refining and developing it; the development process took place during the next six hundred years and made possible the evolution of scales, harmony, and counterpoint. He further claims that these and other attributes of music would eventually evolve into distinct and discernable functions of musical works. He refers to this concept as “differentiation”, stating:

There would be melody, harmony, bass, rhythm, various movements, various themes, sections of movements, etc., and each was distinctly, aurally differentiated from each other part. Tone color, form, tempo, dynamics, texture, tessitura – all were pressed into the service of this differentiation. And this maximum aural differentiation was accomplished and complete in the music of the Baroque and Classical composers… in particular, J.S. Bach and W.A. Mozart.

While the Baroque and Classical eras saw the maximization of differentiation, composers following in the footsteps of Mozart began to place a greater emphasis on expression. Composers of the Romantic era, while seeking uniqueness and distinctiveness of character, began to abandon the established conventions that preceded them; the abandoning of these established conventions can be seen as early as the music of L.V. Beethoven and his idiosyncrasies. When continued long enough, these types of idiosyncrasies eventually become a musical evolution. In the early twentieth-century, for example, the compositional techniques of Claude Debussy initiated an evolution in

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6 Ehle, 22.
7 Ibid.
8 Ibid.
9 Ibid.
10 Ibid.
music where the goal of auditory perception was completely abandoned for the sake of ambience and mood.11

This history of musical evolution in Western music has created a problem and a challenge for composers throughout the centuries.12 In contemporary music, the situation is unique because of the development of new technology, which allows for possibilities in music composition that were previously unavailable.13 Nonetheless, if contemporary composers of Western music intend to be accepted as authentic, they are compelled to develop new sounds, new techniques, and new ways of expression in order to justify the existence of their music.14

The Music of Arnold Schoenberg

Perhaps the most influential composer of the twentieth-century was Arnold Schoenberg. In his early years, he became a pupil of conductor, Alexander Zemlinsky.15 His early works were primarily in the late Romantic style.16 During this early period, Schoenberg composed Verklärte Nacht and the Gurre-Lieder.17 Early in his second period, Schoenberg composed such works as Erwartung, Die glückliche Hand, and the treatise Harmonielehre.18 This period is marked by Schoenberg’s departure from traditional tonality and his acceptance of dissonance as an acceptable means of harmonic

11 Ehle, 22.
12 Ibid.
13 Ibid., 20, 22.
14 Ibid., 22.
16 Ibid., 402.
17 Ibid.
18 Ibid.
expression.\textsuperscript{19} Perhaps his most important work of this period is \textit{Pierrot Lunaire}.\textsuperscript{20} During his third period, Schoenberg introduced \textit{dodecaphony}, or twelve-tone composition.\textsuperscript{21} He left Europe and moved to America, accepting a teaching position in Boston before moving west where he taught at the University of Southern California, and later at the University of California at Los Angeles.\textsuperscript{22} Schoenberg’s notable works during his final period include \textit{String Quartet No. 4}, and \textit{Variations on a Recitative for Organ, A Survivor from Warsaw}, and the opera \textit{Moses and Aaron}.\textsuperscript{23}

\textbf{The Emancipation of Dissonance}

Possibly the most definitive aspect of Schoenberg’s twentieth-century musical influence is what he referred to as the \textit{emancipation of dissonance}.\textsuperscript{24} According to musicologist Stephen Hinton in \textit{The Emancipation of Dissonance: Schoenberg’s Two Practices of Composition}, Schoenberg’s departure from traditional harmonic practice had two distinct purposes. He identifies the first purpose as being historical in the sense that it had a significant and lasting impact on the development of twentieth-century music. He identifies the second purpose as being technical in the sense that it provided a new and distinct set of techniques available for composers. He further claims that it necessitated the development of a new approach to musical analysis.\textsuperscript{25}

\textsuperscript{19} Foss, 402.
\textsuperscript{20} Ibid.
\textsuperscript{21} Ibid.
\textsuperscript{22} Ibid.
\textsuperscript{23} Ibid.
\textsuperscript{25} Ibid., 568, 569.
While it is generally accepted that the origin of Schoenberg’s harmonic dissonance can be found in the music of Wagner, philosopher Theodor Adorno introduced another view based on social expressionism:

Perhaps the emancipation of dissonance is not the conclusion of the late-Romantic, post-Wagnerian development, as official music history teaches us. Rather, it is a desire that has accompanied, as its dark side, all bourgeois music since Gesualdo and Bach, comparable to the covert role played by the unconscious in the history of bourgeois reason. This is no mere analogy. Rather, from the very beginning, dissonance conveyed the meaning of all that is placed under the taboo of order; it assumes responsibility for instinctual impulses that have been censored.\(^\text{26}\)

Schoenberg’s music having Wagnerian roots, and dissonance being the result of expressionism are not necessarily mutually exclusive concepts. Even if seventeenth-century composers used dissonance as a means of musical and social rebellion, it does not necessarily exclude the possibility that Wagner’s heavily chromatic works had an influence on the works of Schoenberg. It may however, put Schoenberg’s music and the music he influenced in a different historical context. If Adorno is correct and musical dissonance is a function of social disorder, then perhaps Schoenberg helped to establish an era of anarchy. If Schoenberg actually helped to create an age of anarchy in contemporary music composition, dissonance may no longer be a function of its relationship to consonance.

Music as a Means of Communication

Robert Ehle, theorizes that music is artificial in the sense that it is developed differently by different cultures throughout the world.\(^\text{27}\) In many ways, music can be

\(^{26}\) Hinton, 570.
\(^{27}\) Ehle, 20.
perceived as a language; they possess many of the same essential attributes.\textsuperscript{28} Linguist Morton Bloomfield and Leonard Newmark made the following commentary concerning the evolution of the English language:

\begin{quote}
Although one must follow certain grammatical norms in order to be considered educated, one should realize that much that has gone into the making of English is due to the replacing of some norms by others. The “errors” of the past have made present-day English for us. A language which is alive will change its rules and what is considered correct at one time may only be a current fad. This, of course, is not to say that “anything goes,” but it should suggest tolerance and understanding in linguistic matters.\textsuperscript{29}
\end{quote}

Similar to the English language, the language of tonality has evolved as well.\textsuperscript{30} An example of the evolution of tonal harmony can be seen in the use of the Neapolitan Sixth chord.\textsuperscript{31} While the early applications suggest the chord functions as a subdominant, uses of the chord in Schubert’s \textit{String Quartet in D Minor}, Beethoven’s \textit{Symphony No. 3}, and Brahms’s \textit{Piano Quintet in F Minor} demonstrate alternate chord functions.\textsuperscript{32}

If music is indeed a language, or at the very least, what Nelson Goodman calls “a symbol system”, then it is incumbent upon every composer to communicate to his audience using a system of rules.\textsuperscript{33} If dissonance has truly been emancipated, then the historical conflict between consonance and dissonance as a function of harmony is likely non-existent. This situation could create an interesting and complex problem for the

\textsuperscript{29} Graham Phipps, “Comprehending Twelve-Tone Music: 'As an Extension of the Primary Musical Language of Tonality',” \textit{College Music Symposium} 24, no. 2 (Fall, 1984): 38.
\textsuperscript{30} Ibid.
\textsuperscript{31} Ibid., 38-40.
\textsuperscript{32} Ibid.
\textsuperscript{33} Clark, 198, 199.
contemporary composer. By what means would a contemporary composer create order in a musical society that exists anarchically?

Twelve-Tone Technique

Schoenberg’s system of dodecaphony was designed to bring a sense of order and cohesion to music that was missing a sense of restrained dissonance.\(^{34}\) Schoenberg’s approach to twelve-tone music centered on the relationship between one tone to another, while traditional harmony focused on the relationship between each tone and its tonal center.\(^{35}\) In this way, Schoenberg brought order to a system of music that relied on an equality of twelve chromatic tones.\(^{36}\)

The fundamental principle of Schoenberg’s twelve-tone technique is built on the tone row; the tone row is an ordered array of all twelve chromatic pitches.\(^ {37}\) The tone rows usually consist of the original, or prime row and transformations of the prime row; transformations of the tone row may include inversion and retrograde techniques.\(^ {38}\)

Example 1 shows the tone row used by Schoenberg in *Serenade, op. 24*.\(^ {39}\)

![Tone Row Diagram](image)

Example 1: Schoenberg, Tone Row, *Serenade, op. 24*\(^ {40}\)

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\(^{35}\) Ibid., 7, 19.

\(^{36}\) Ibid., 7.


\(^{38}\) Ibid.

\(^{39}\) Ibid.

\(^{40}\) Ibid.
According to theorist Graham Phipps in *Comprehending Twelve-Tone Music as an Extension of the Primary Musical Language of Tonality*, Schoenberg viewed twelve-tone music as a natural evolution of the music of his predecessors even though some considered his music to be a departure from traditional tonality. Phipps points to Schoenberg’s writings as evidence of this assertion; they reveal that Schoenberg considered his music to be steeped in the traditions of Austrian music and that he rejected the term “atonality”. He additionally points to Schoenberg’s essays to affirm the fact that he was highly focused on the relationship between his music and the musical language of earlier nineteenth-century composers.\(^{41}\)

One of the most important concepts of Schoenberg’s technique is the *Grundgestalt* principle, or “basic shape”.\(^{42}\) In the early stages of a piece of music, a musical idea is stated, repeated, and developed throughout the composition; this thematic material becomes the Grundgestalt.\(^{43}\) Not to be confused with Grundgestalt, *Musikalische Gedanke* is the term Schoenberg used in reference to the “musical idea” of a piece of music.\(^{44}\) Schoenberg’s concept of the “musical idea” of a piece was achieved through the development of the Grundgestalt, which unified the music.\(^{45}\) Being an advocate of Western tonal music, Schoenberg sought to bring structural integrity and cohesion to his chromatic music through the Grundgestalt principle.\(^{46}\) Schoenberg explained it in this manner: “The most important capacity of a composer is to cast a glance into the most

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\(^{41}\) Phipps, 36.  
\(^{43}\) Ibid.  
\(^{45}\) Neff, 12.  
\(^{46}\) Phipps, 37.
remote future of his themes and motives. He has to be able to know beforehand the consequences which derive from the problems existing in his material, and to organize everything accordingly.\textsuperscript{47}

In addition to the Grundgestalt principle and Musikalische Gedanke, it is helpful to understand Schoenberg’s attitude toward harmony; Schoenberg perceived harmony horizontally as well as vertically.\textsuperscript{48} Example 2 shows a partial sketch of a theme Schoenberg considered for his \textit{Suite, Op. 29}.\textsuperscript{49}

Example 2: Schoenberg, Sketch of Tone Row, \textit{Op. 29, II}\textsuperscript{50}

While the two themes depicted in the example maintain the consistency of the tone row order, the theme has both harmonic and melodic significance.\textsuperscript{51} According to musicologist Martha MacLean Hyde in \textit{The Telltale Sketches: Harmonic Structure in Schoenberg's Twelve-Tone Method}, the order of the tone row is preserved through all twelve chromatic pitches horizontally, but vertically, the row is divided into two voices,

\begin{itemize}
\item \textsuperscript{47} Phipps, 37.
\item \textsuperscript{49} Ibid., 562, 563.
\item \textsuperscript{50} Ibid., 563.
\item \textsuperscript{51} Ibid.
\end{itemize}
which function harmonically. She further identifies the upper voice order as 1, 2, 3, 5, 10, 12, and the lower voice order as 4, 6, 7, 8, 9, 11. She concludes that Schoenberg was able to create a model that functioned on two distinct levels by dividing the row into two voices.\textsuperscript{52} Interestingly, Schoenberg considered pitches to be functioning harmonically as long as they were “comprised within the same spatial continuum”.\textsuperscript{53} As a result, each voice in the example functions harmonically as well.\textsuperscript{54}

\textbf{Schoenberg’s Legacy}

Arnold Schoenberg endured a tremendous amount of criticism throughout his lifetime; much like Igor Stravinsky, Schoenberg’s concerts resulted in the occasional altercation, and Richard Strauss thought Schoenberg was "better off shoveling snow than composing music".\textsuperscript{55} The twelve-tone technique, however, was instrumental in intellectualizing Western music.\textsuperscript{56} While the issues of tonality and dissonance, and the conflict that they create is in no way a new challenge for the composer, many see the twelve-tone technique as a satisfactory method of composing chromatic music.\textsuperscript{57} The Second Viennese School, consisting of Schoenberg and his students, notably Alban Berg and Anton Webern, popularized the twelve-tone technique throughout the twentieth century.\textsuperscript{58}

\textsuperscript{52} Hyde, The Telltale Sketches, 563.
\textsuperscript{53} Ibid., 562.
\textsuperscript{54} Ibid., 562, 563.
\textsuperscript{55} Ibid., 579.
\textsuperscript{56} Arved Ashby, “Schoenberg, Boulez, and Twelve-Tone Composition as 'Ideal Type,'” \textit{Journal of the American Musicological Society} 54, no. 3 (Autumn, 2001): 585.
\textsuperscript{57} Ibid.
Before Schoenberg’s 1933 arrival to the United States, he was rejected as a chromatic composer who created largely unperformed works. After leaving Europe, Schoenberg came to be known more as a theorist than a composer; he was invited to lecture more than he was awarded commissions to compose new music. Perhaps not completely comfortable with being labeled “The Twelve-tone Constructor”, he preferred to deliver his message through music instead of discourse.

Total serialism as a technique grew from the foundation of twelve-tone music created and developed by Schoenberg; composers such as Pierre Boulez and Milton Babbitt were advocates of atonal music and total serialism. Babbitt, in fact, wrote a 1958 article insisting that it was irrelevant if anyone listened to his music because the success of his music was not dependent on its acceptance or enjoyment by others. He further asserted that atonal music is structured in such a way that more is required on the part of the listener to perceive the intention of the composer than it is with tonal music. In contrast, there were composers who sought to create music rooted in traditional tonality, but many viewed their works to be insignificant. While Babbitt may have dismissed the notion of having his music understood by listeners, many consider communication to be a primary objective of music. As a possible consequence of atonality and serialism, some contemporary composers developed new techniques. Moreover, some composers have taken time to develop extensive, well-defined

59 Hyde, The Telltale Sketches, 579.
60 Ibid.
61 Ibid.
62 Ball, 1, 2.
63 Ibid., 1.
64 Ibid., 2.
65 Ibid., 1.
66 Ibid., 2.
procedures. For the sake of context and clarity, it may be beneficial to briefly examine the techniques of two of these composers.
CHAPTER 2
THE TECHNIQUES OF GYÖRGY LIGETI AND ARVO PÄRT

Early Style of György Ligeti

György Ligeti spent his early years in Hungary, but he eventually immigrated to Vienna in 1956, and subsequently to Cologne in 1957. Although he lacked access to the music of the composers of his day, his music possessed a great deal of originality. Throughout much of his life, however, Bartok, Stravinsky, and Schoenberg had a significant influence on his music. In fact, he began to compose in a derivative of the twelve-tone style before he left Hungary. Musica Ricercata is a work consisting of eleven movements; Ligeti uses each movement to present a different chromatic tone to the previous movements, beginning with an “A” and concluding with a “D” in the eleventh movement. At this stage in his compositional development, Ligeti was already thinking in innovative ways. Around mid-century, he made a conscious decision to abandon all he had previously learned about music and to focus on exploring attributes such as pitch, rhythm, and harmony in ways he had not explored earlier. Apparitions, which Ligeti began composing while living in Budapest, was one of his early works.

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69 Ibid.
70 Ibid., 532, 533.
71 Ibid.
73 Ibid.
where these ambitions were realized.\textsuperscript{74} His primary objective was to create a technique that would allow him to compose the music that he heard in his head.\textsuperscript{75} He once stated:

I first began to think of static music you find in \textit{Atmospheres} and \textit{Apparitions} in 1950; music wholly enclosed within itself, free of tunes, in which there are separate parts but they are not discernable, music that would change through gradual transformation almost as if it changed its colour from the inside. Before writing down a composition, first I always imagine what it would should [sic] like; I can practically hear the various instruments play. Around 1950, I could hear the music I imagined but I did not possess the technique of imagining it put on paper.\textsuperscript{76}

In \textit{Aesthetic Appropriation of Electronic Sound Transformations in Ligeti’s Atmosphères}, musicologist Sarah Davachi declares that although Ligeti was well immersed in serial composition, he had reservations concerning the technique as stated in his formal criticism of Pierre Boulez. In addition, she asserts that Ligeti’s concerns were partly based on what he considered to be a lack of control with regard to serialism and aleatory; he felt there was too little control with respect to timbre and articulation.

According to Davachi, Ligeti had certain reservations concerning the listener’s inability to perceive the actual aleatoric process.\textsuperscript{77}

Perhaps these concerns with serial music helped to attract Ligeti to certain elements of electronic music.\textsuperscript{78} Soon Ligeti began to take aspects that were unique to electronic music and apply it to his own.\textsuperscript{79} In an interview, Ligeti stated:

…I learned that if you have a sequence of sounds where the difference in time is less than 50 milliseconds then you don’t hear

\textsuperscript{74} Nordwall, 22.  
\textsuperscript{75} Rourke, 533.  
\textsuperscript{76} Ibid.  
\textsuperscript{77} Davachi, 115.  
\textsuperscript{78} Rourke, 533, 534.  
\textsuperscript{79} Ibid., 534.
them any more as individual sounds. This gave me the idea of creating a very close succession in instrumental music…

His experience with electronic music was a fundamental influence on Ligeti and would help define his unique style as a composer. Ligeti’s appreciation of electronic music would ultimately evolve into a contemporary technique called *micropolyphony*.

**Micropolyphony**

Micropolyphony was designed to function on two basic levels. On an external level, it was easily perceptible to the listener; at the same time, it was structured so that the building blocks of harmony and counterpoint were completely imperceptible. As Ligeti explained:

> Technically speaking I have always approached musical texture through part-writing. Both *Atmosphères* and *Lontano* have a dense canonic structure. But you cannot actually hear the polyphony, the canon. You hear a kind of impenetrable texture, something like a very densely woven cobweb. I have retained melodic lines in the process of composition, they are governed by rules as strict as Palestrina’s or those of the Flemish school, but the rules of this polyphony are worked out by me. The polyphonic structure does not come through, you cannot hear it; it remains hidden in a microscopic, underwater world, to us inaudible. I call it micropolyphony (such a beautiful word!).

Between 1953 and 1960, micropolyphony began to take shape as a compositional technique. Of particular importance was his close working relationship with Michael...

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80 Rourke, 534.
81 Ibid., 535.
82 Ibid., 534, 535.
84 Ibid.
85 Ibid.
86 Davachi, 111-13.
Koenig and Karlheinz Stockhausen.\textsuperscript{87} Working with these composers in Cologne is where he was exposed to the electronic music that would in large part shape the aesthetics of micropolyphony.\textsuperscript{88} It should be noted that the seeds of micropolyphony probably existed prior to his interaction with electronic music composers; however, “expansion of tone colour, development of montage and canonical structures to create texture and dimension, the juxtaposition of formal dialectics such as stasis and motion or continual and discrete movement, and the perceptible transformation of sound in musical space” were developed to a much greater extent after his travels to Cologne.\textsuperscript{89} It was his travels to Cologne that significantly helped him to define and shape his new technique and gain an appreciation of the concepts of density and transformation of sound; these concepts would become important attributes in micropolyphony.\textsuperscript{90}

Ligeti’s intention in part, when composing \textit{Apparitions} was to completely remove “intervals as structural components”.\textsuperscript{91} In his words:

\begin{quote}
I composed sound webs of such density that the individual intervals within them lost their identity and functioned simply as collective interval groups… this meant that pitch function had also been eliminated…. Pitches and intervals now had a purely global function as aspects of compass and note density.\textsuperscript{92}
\end{quote}

\textsuperscript{87} Davachi, 111.  
\textsuperscript{88} Ibid.  
\textsuperscript{89} Ibid., 111, 112.  
\textsuperscript{90} Ibid.,113.  
\textsuperscript{92} Ibid.
The chromaticism in *Apparitions* was not to serve a harmonic function, but to add density to his music.\(^93\) His intention was also to smoothly transition from one event to the next as each section affects other sections.\(^94\) He explains:

> The states are broken up by suddenly emerging events and are transformed under their influence, and vice versa: the altered states also have a certain effect upon the type of events, for these must be of ever new character, in order to be able further to transform the transformed state. In this way arises an unceasing development: states and events, once they have occurred, reciprocally exclude their repetition, thus are irretrievable.\(^95\)

In *Apparitions*, the spatial relationship between pitches is a priority to Ligeti and the resultant sound is one that is intentionally original, lacking repetition.\(^96\)

In *Lontano*, Ligeti’s micropolyphony is canonical in nature.\(^97\) Example 3 shows the first four measures of *Lontano*.\(^98\) The entrance of the woodwinds are marked quadruple piano, and the mutes on specified instruments indicate an emphasis on the fundamental pitch.\(^99\) Among the more interesting aspects of *Lontano* is how Ligeti brings attributes such as dynamics and timbre into the foreground, while deemphasizing pitch and rhythm.\(^100\) The structural foundation of pitch and harmony act as unifying agents in

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\(^93\) Bernard, Inaudible Structures, 212.
\(^94\) Ibid., 213.
\(^95\) Ibid.
\(^96\) Ibid.
\(^98\) Ibid., 40.
\(^99\) Ibid., 39.
\(^100\) Ibid., 41, 42.
Western music. Ligeti, however, reorganizes these principles, emphasizing texture through timbre, dynamics, and articulation.

Example 3: Ligeti, *Lontano*, mm. 1-4

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101 Bauer, 41, 42.
102 Ibid.
103 Ibid., 40.
Lontano demonstrates the influence of electronic music on Ligeti’s compositions after living in Cologne; the combination of slight pauses in each instrumental part with the simple pitch frequencies selected by Ligeti, imitate electronic pulse sensations.\textsuperscript{104}

Ligeti described this technique as follows:

This combination produces a new timbre that didn’t exist with separate instruments; it comes from my experience in the electronic music studio, although I don’t employ any electronic sounds. I use very few special instrumental effects; a few in Apparitions, but more in the suite. In Lontano, one plays normally, but the totality, the combination, the manner of combining the instrumental voices gives new timbres.\textsuperscript{105}

Examining the canonical structure of Lontano, mm. 92-122, reveals the extreme range of dynamics through orchestration.\textsuperscript{106} Sixty-three lines of canon are performed, eventually diminishing to three; Ligeti builds tension by increasing the pitch density and creating a sound mass of chromatic harmony in mm. 93-112.\textsuperscript{107}

Ligeti’s colleague Koenig determined that it is impossible to distinguish individual notes that are performed in succession at a rate of one twentieth of a second.\textsuperscript{108} This became an important feature in micropolyphony.\textsuperscript{109} Although it is impossible to perform notes at this rate on acoustic instruments, Ligeti achieved a similar effect by rhythmically offsetting the individual instruments.\textsuperscript{110} In Lontano, Ligeti incorporates a motivic figure into his canon of micropolyphony, which gradually increases in dynamics

\textsuperscript{104} Bauer, 55.
\textsuperscript{105} Ibid.
\textsuperscript{106} Ibid., 56.
\textsuperscript{107} Ibid.
\textsuperscript{108} Ibid.
\textsuperscript{109} Ibid., 56-8.
\textsuperscript{110} Ibid., 58.
in mm. 102-12. The subsequent measures focus more heavily on tone color. Ligeti explains the importance of tone color in micropolyphony: “The music has something artificial about it: it is an illusion. There are many elements in it that don’t manifest themselves, but remain subliminal…. So I am of the opinion that this is not a return to traditional intervallic and harmonic music, but rather that harmony and intervals are treated as though they were tone colors.”

With micropolyphony, Ligeti breached conventional musical norms and traditions. By replacing foreground elements of traditional Western music with timbre and dynamics, Ligeti has helped to change the very nature of how music is perceived. Pierre Boulez stated that one of his goals was to essentially erase all that he understood about traditional Western music and construct a foundation upon which he could build new principles and techniques. By focusing on texture as a primary attribute of his compositional technique, Ligeti achieved this objective.

**Early Style of Arvo Pärt**

As a young composer, Arvo Pärt spent much of his time composing serial music such as *Credo* and *Solfeggio*. *Credo*, written for piano, chorus, and orchestra, was

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111 Bauer, 58.
112 Ibid., 58, 59.
113 Ibid., 59.
114 Ibid., 41, 42.
115 Ibid., 61.
116 Ibid.
117 Ibid., 61, 62.
composed in 1968. With *Credo*, Pärt was successful in his attempt to seamlessly reconcile two contrasting musical elements; as a composer, however, Pärt was not satisfied with twelve-tone music. Although there are aspects of his work with *Credo* that influenced his development as a composer, Pärt’s dissatisfaction with serial music compelled him to seek alternate methods of musical expression. It was after the completion of *Credo* that Pärt refrained from composing new works in order to develop a new compositional technique.

**Tintinnabuli Technique**

The tintinnabuli technique revolves around two voices. The first voice is melodic and the second voice is the tintinnabuli voice; the word *tintinnabuli* means “bells” and refers to the triadic harmonies in the second voice of the technique. Pärt’s style is considered minimalist due to the repetitive nature of the tintinnabulation.

According to Jann Passler, *post modernism* is the renunciation of increasingly intellectual and complex musical structures that came about in the twentieth-century. Tintinnabuli is a return to the spiritual roots and mysticism of Western music. Consequently, Pärt’s music is often compared to the music of composers such as John Tavener.

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120 Ibid., 20.
121 Quinn, 20
122 Muzzo, 24.
123 Ibid., 23.
124 Ibid.
125 Ibid., 23, 27.
126 Ibid., 27.
127 Ibid.
128 Ibid., 25.
Much like other minimalist composers, Pärt’s music is often characterized as being simple; in large part, this may be due to the composer, as Arvo Pärt has asserted that his goal in developing his new technique was simplicity.\textsuperscript{129} With regard to vocal music, simplicity helps the text to be clearly heard and understood.\textsuperscript{130} Pärt has explained how the tintinnabuli technique allows him to simplify and unify his music:

Tintinnabulation is an area I sometimes wander into when I am searching for answers in my life, my music, my work…. The complex and many-faceted only confuses me, and I must search for unity…. I have discovered that it is enough when a single note is beautifully played. This one note, or a silent beat, or a moment of silence, comforts me. I work with very few elements—with one voice, with two voices. I build with the most primitive materials—with the triad, with one specific tonality. The three notes of the triad are like bells. And that is why I called it tintinnabulation.\textsuperscript{131}

\textit{Te Deum}, a work composed by Pärt for orchestra, mixed chorus, and soloists uses the tintinnabuli technique.\textsuperscript{132} The individual voices of \textit{Te Deum} are shown in Examples 4 and 5; the tintinnabuli-voice is contained in the soprano and tenor voices, while the melodic-voice is given to the alto and bass voices.\textsuperscript{133}

\begin{center}
\includegraphics[width=\textwidth]{example4.png}
\end{center}

Example 4: Pärt, \textit{Te Deum}, Tintinnabuli-voice \textsuperscript{134}

\begin{thebibliography}{9}
\bibitem{129} Muzzo, 27.
\bibitem{130} Ibid.
\bibitem{131} Ibid., 28.
\bibitem{132} Ibid.
\bibitem{133} Ibid.
\bibitem{134} Ibid.
\end{thebibliography}
Example 5: Pärt, *Te Deum*, Melodic-voice\textsuperscript{135}

Example 6 shows the four melodic “cells” constructed from the alto melodic-voice.\textsuperscript{136}

Example 6: Pärt, *Te Deum*, Modes\textsuperscript{137}

Each pitch of the melodic-voice is deigned by Pärt to move by step relative to the dominant of D minor, which is maintained in the tintinnabuli-voice.\textsuperscript{138} Pärt constructs the four-part harmonization of *Te Deum* so that equilibrium is maintained among the alto, soprano, tenor, and bass voices.\textsuperscript{139}

According to musicologist Grace Muzzo in *Systems, Symbols, & Silence: The Tintinnabuli Technique of Arvo Pärt in the Twenty-First Century*, the text of *Te Deum* determines the rhythmic elements of this relatable work, with a direct correlation between word quantity in a given phrase and pitch quantity used to convey them. She further states that the unstressed syllables receive only a single beat and a single pitch, while the

\begin{footnotesize}
\textsuperscript{135} Muzzo, 28.
\textsuperscript{136} Ibid., 26.
\textsuperscript{137} Ibid.
\textsuperscript{138} Ibid., 28.
\textsuperscript{139} Ibid.
\end{footnotesize}
stressed syllables receive more. Finally, she notes that Pärt uses irregular and uneven phrasing and mixed meter throughout *Te Deum* in order to create rhythmic interest.\(^\text{140}\)

*Te Deum* is simple in its harmonic construction by modernist standards, according to Muzzo. She claims that there are no true chord progressions in this work; it maintains its function in D minor. Further, she states that Pärt incorporates pedal tones in order to emphasize the tonal function throughout most of the work.\(^\text{141}\)

Through rhythm, texture, and impeccable tone quality, the tintinnabuli technique has allowed Pärt a means to compose music consisting of a rich, expressive musical language.\(^\text{142}\) While richly expressive, Pärt also achieved his goal of simplicity.\(^\text{143}\) Without the complexities of atonality and serialism, Pärt has provided a canvas for the text of his vocal works to communicate to his audience.\(^\text{144}\) Consequently, it could be argued that with tintinnabuli, Pärt was able to create a compositional technique in which a listener can derive meaning from the music without having to understand the compositional process used to create it.

Therefore, creating new techniques may provide a composer with the capacity to establish a unique identity as well as their own compositional voice. These techniques may be rooted in serialism and non-tonal music. Some techniques may have their foundation in traditional tonality. A new technique may be a synthesis of the traditional and the contemporary. The remainder of this dissertation will focus on the development

\(^{140}\) Muzzo, 29.  
\(^{141}\) Ibid.  
\(^{142}\) Ibid., 29, 30.  
\(^{143}\) Ibid., 30.  
\(^{144}\) Ibid.
of a new technique; this technique is based on elements of neo-Riemannian theory, parsimonious voice leading, and two types of motives.
Harmonic dualism is “a school of musical theoretical thought which holds that the minor triad has a natural origin different from that of the major triad, but of equal validity.” According to theorist Henry Klumpenhouwer, harmonic dualism centers around two basic principles; major and minor harmonies are substantively equal, and major and minor harmonies are inversions of each other. Essentially, dualism adheres to the belief that the minor triad is established through a downward, or negative arrangement of pitches, while the major triad is established through an upward, or positive arrangement.

For quite some time, theorists have proposed views about the origin of the minor triad that were eventually disproven. For example, in 1722, Jean Phillipe Rameau argued that the minor triad is merely the major triad with a lowered third, until he learned of the effect of sympathetic vibration on strings. Consequently, in 1737, he wrote *Génération harmonique*, in which he introduced the idea that the C major triad and the F minor triad were both formed on lower strings by the sympathetic vibrations of a higher

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147 Snyder, 45.
148 Ibid., 46.
149 Ibid.
By 1750, however, Rameau had to abandon his dualistic approach based on the scientific discovery that his theory did not work when applied to longer strings.\(^{151}\)

In 1853, Moritz Hauptmann developed the first exhaustive theory of harmonic dualism; in his book, *Die Natur der Harmonik und der Metrik*, Hauptmann argues for the existence of the octave, the perfect fifth, and the major third as the only absolutely perceptible intervals.\(^ {152}\) Additionally, he constructs a "Hegelian dialectic" to support his argument; each interval is seen as a dilution of sound compared to a pure sonority.\(^ {153}\) The thesis is the octave, which functions as half of the complete sound ("unity"); the antithesis is the perfect fifth, which functions as two of the three equal parts that constitute the complete sound, or two times the sound that remains ("duality").\(^ {154}\) The synthesis is the major third, which functions as four of the five equal parts that constitute the complete sound, or twice the remaining sound times two ("duality as unity").\(^ {155}\)

Consequently, triads are constructed in the following manner:\(^ {156}\)

\[
\begin{array}{c}
\text{I} \\
C & e & G \\
\text{II} \\
\end{array}
\]

Where I represents the octave or unison, II represents the fifth, and III represents the third of the triad.\(^ {157}\) Hauptmann referred to I as the *Einheit*, which is the only pitch that

\(^{150}\) Snyder, 46.
\(^{151}\) Ibid.
\(^{152}\) Ibid., 47.
\(^{153}\) Ibid., 47, 48.
\(^{154}\) Ibid.
\(^{155}\) Ibid.
\(^{156}\) Ibid., 48.
\(^{157}\) Ibid.
functions harmonically with the other two pitches.\(^{158}\) When attempting to explain the minor triad by these same organizational principles shown above, certain issues emerge.\(^{159}\) For example, the minor triad cannot be built in an upward fashion from one central pitch by the octave, the perfect fifth, or the major third, which are the only absolutely perceptible intervals.\(^{160}\) Because Hauptmann rejects the *double-generator* theory, he solves this problem by constructing the minor triad in the opposite direction of the major triad, keeping the root of the major triad as the central pitch:\(^{161}\)

\[
\begin{align*}
\text{II} & \rightarrow \text{I} \\
\text{F} & \rightarrow \text{a}_\text{b} \rightarrow \text{C} \\
\text{III} & \rightarrow \text{I}
\end{align*}
\]

The major triad is described as “active”, while the minor triad is described as “passive”.\(^{162}\)

To add further support for his dualistic claim, Hauptmann turns to the harmonic series; the major triad is determined to be partials 4, 5, and 6, while the minor triad is 10, 12, and 15.\(^{163}\) This creates the following model for major and minor triads:\(^{164}\)

\[
\begin{align*}
\frac{4:5:6}{C} &= \frac{4:5:6}{1} = (4:5:6)^{1} \\
\frac{10:12:15}{E} &= \frac{1}{4:5:6} = (6:5:4)^{-1}
\end{align*}
\]


\(^{159}\) Snyder, 48, 49.

\(^{160}\) Ibid.

\(^{161}\) Ibid.

\(^{162}\) Ibid., 49.

\(^{163}\) Ibid.

\(^{164}\) Ibid.
Additionally, Hauptmann constructs tonal scale models by creating “triads of triads” with the components of the major scale organizations as follows:\(^{165}\)

\[
\begin{array}{ccc}
I & -III - II \\
F & a & C & e & G & b & D \\
I & -III - II \\
\end{array}
\]

Hauptmann determined the minor scale models based on the following:\(^{166}\)

\[
\begin{array}{ccc}
II & -III - I \\
d & F & a & C & e & G & b \\
II & -III - I \\
\end{array}
\]

Because of the absence of a major triad in the minor model, Hauptmann created the harmonic minor model, which consists of two minor triads connected to a dominant major triad:\(^{167}\)

\[
\begin{array}{ccc}
II & -III - I \\
F & a^b & C & e^b & G & b & D \\
II & -III - I \\
\end{array}
\]

While Hauptmann’s approach provides an explanation for the major and natural harmonic minor scale models, he fails to explain why the minor scale model needs a major triad as a means of validation; altering the natural minor model to the harmonic minor implies the inequity of the major and minor scale models.\(^{168}\) Additionally, the C

\(^{165}\) Snyder, 50.
\(^{166}\) Ibid.
\(^{167}\) Ibid.
\(^{168}\) Ibid.
harmonic minor scale system has G as the central pitch of two triads.\(^{169}\) Consequently, Hauptmann constructs the “major-minor” tonality with C as its central pitch as follows:\(^{170}\)

\[
\begin{array}{ccccccc}
II & -III- & I & & I & -III- & II \\
F & a^b & C & e & G & b & D \\
I & -III- & II
\end{array}
\]

In this model, the C becomes the central pitch of two triads, however Hauptmann neglects to cite musical examples to substantiate his views.\(^{171}\) Also, a problem exists in the minor scale models concerning the central pitch; in the harmonic minor model, the central pitch is the fifth scale degree.\(^{172}\) Consequently, there is a functional dominant, but there is no functional tonic.\(^{173}\)

In *Das duale Harmoniesystem*, Arthur von Oettingen challenged the notion that the minor triad was merely a major triad with a lowered third.\(^{174}\) Instead, he argued that the major and minor triads are best understood within the context of the “tonic ground-tone” and “phonic overtone”, shown in Example 7.\(^{175}\)

\[\text{Example 7: von Oettingen, Tonic Ground-Tone and Phonic Overtone}\]
While the tonic ground-tone, or the fundamental pitch of the major triad is its central point, the phonic overtone, or the first partial shared by each tone, is the central point of the minor triad. One of the criticisms concerning von Oettingen’s view is the fact that the fifth is the same interval in major as well as minor harmonies. Also, while the phonic overtone is audible, and disputing its existence is problematic, issues arise when attempting to equate its importance with the actual root of a chord.

Perhaps the most prominent apologist for harmonic dualism was Hugo Riemann. Riemann’s views on dualism developed early and remained fairly consistent throughout his career. He was persistent in his beliefs even in light of the evidence that mounted against him; his inflexibility may have negatively influenced other aspects of his scholarly works as well.

Example 8: Riemann, Overtones, notes four, five, and six

Riemann insisted the fifth of any given major triad is a unique point, which he refers to as a Prime. If the identical intervals produced by the overtone series were built downward

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177 Snyder, 52.
178 Ibid., 53.
179 Ibid.
180 Ibid.
181 Ibid., 53, 54.
182 Ibid.
183 Ibid., 54.
184 Ibid., 51-54.
from the Prime, the minor triad would be found within the overtone series on the fourth, fifth, and sixth notes.\textsuperscript{185} Example 8 shows the C minor triad constructed in such a fashion from the note G.\textsuperscript{186}

\textit{Inversional symmetry} played an important role in Riemann’s ideas of harmonic dualism.\textsuperscript{187} Symmetry, in this context, is defined as functional invariance under certain transformations.\textsuperscript{188} Such symmetry can be seen in transformations like transposition, pitch reordering, octave displacement, and duplication of pitch.\textsuperscript{189} Example 9 demonstrates how symmetry plays a role through the transformations of extension and transposition.\textsuperscript{190}

\textbf{Example 9: Extension and Transpositional Symmetries}\textsuperscript{191}

Example 9(b) is the result of extending Example 9(a) by adding thirds, and Example 9(c) is the product of transposing Example 9(a).\textsuperscript{192} With Riemann, this concept was extended to inversion.\textsuperscript{193} Similar to his downward construction of overtones with respect to the

\footnotesize
\begin{footnotes}
\textsuperscript{185} Snyder, 54.
\textsuperscript{186} Ibid.
\textsuperscript{188} Ibid., 246.
\textsuperscript{189} Ibid., 249.
\textsuperscript{190} Ibid.
\textsuperscript{191} Ibid.
\textsuperscript{192} Ibid., 249, 250.
\textsuperscript{193} Ibid., 250, 251.
\end{footnotes}
Prime, Riemann viewed minor triads as inversions of major triads.\textsuperscript{194} Example 10 shows Riemann’s application of inversionsal symmetry.\textsuperscript{195}

Example 10: Inversionsal Symmetry\textsuperscript{196}

The intervallic consistency through transposition and inversion is displayed in Example 10(a); in Example 10(b), C minor is the inversion of C major.\textsuperscript{197} The chord tones in the C minor triad are labeled in such a fashion, that the fifth becomes the root, the third remains the third, and the root becomes the fifth.\textsuperscript{198} Riemann established the term \textit{Gegenquintschritt} to characterize the two different progressions shown in Example 10(c).\textsuperscript{199} The example essentially equates the C major to F major progression with the C minor to G minor progression because they are functionally the same under the transformation of inversion.\textsuperscript{200} It should be noted that Riemann established inversionsal symmetry primarily through the labeling of chord tones and that conventional harmonic practice did not generally adhere to genuine symmetrical harmonic progressions.\textsuperscript{201}

\begin{align*}
\text{Example 10: Inversional Symmetry}
\end{align*}
Similar to the theories proposed by Rameau, Riemann also based much of what he believed on the sympathetic vibration of strings. Because the division of a string using specified integers determines the overtone series, Riemann concluded the undertone series should be calculated by the multiplication of a string by the same integers. Riemann relied on support from earlier theorists such as Zarlino and Tartini to validate his dualist views. Because Riemann believed Rameau was persuaded to rethink his views by physicist Jean D’Alembert, he rejected Rameau’s later theories regarding the minor triad and sympathetic string vibration.

The main issue with the concept of building minor triads using the overtone series in downward fashion is that it exists only in theory and still must be proven scientifically. Similar challenges exist with attempts to prove the existence of inversional symmetry. Riemann insisted that minor triads are the antithesis of major triads and consequently, minor triads are the result of the undertone series, just as major triads are the result of the overtone series. However, as strongly as Riemann believed in the existence of undertones, he was unable to provide scientific evidence to validate his theory.

French composer, Vincent d’Indy proposed a dualistic theory based on sympathetic vibrations. In *Cours de Composition Musicale*, he constructed the

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202 Snyder, 54.
203 Ibid.
204 Ibid., 55, 56.
205 Ibid., 56.
206 Ibid., 54.
207 Tymoczko, Dualism and the Beholder’s Eye, 251.
208 Snyder, 54.
209 Ibid., 56.
210 Ibid., 59-62.
overtone series by dividing a string by a sequence of integers; he derived the undertone series by multiplying the string by the same sequence of integers.\textsuperscript{211} He called the overtone series \textit{résonnance supérieure} and the undertone series \textit{résonnance inférieure}.\textsuperscript{212} d'Indy considered the root of the major triad the “prime” of the chord and the fifth of the minor triad the “prime” of the chord; he considered the minor scale to be the inversion of the major scale.\textsuperscript{213} Consequently, he constructed his major and minor scales as Ionian and Phrygian modes respectively.\textsuperscript{214}

In 1931, Matthew Shirlaw wrote an article titled \textit{The Minor Harmony}.\textsuperscript{215} Referring back to string vibration, he adopted a dualistic approach to major and minor harmony.\textsuperscript{216} Analyzing the lengths of strings and frequencies of major and minor triads, Shirlaw discovered that the minor is the reverse of the major.\textsuperscript{217} Examples 11(a) and 11(b) show the order of frequencies corresponding to major and minor triads and how they are represented in musical notation form.\textsuperscript{218}

\begin{align*}
\text{Major} & \quad \text{string lengths} \quad *1 : \frac{1}{2} : \frac{1}{3} : \frac{1}{4} : \frac{1}{5} : \frac{1}{6} \quad \text{Hz} \\
\text{Minor} & \quad \text{string lengths} \quad 1 : 2 : 3 : 4 : 5 : 6 \quad \text{string lengths} \\
\end{align*}

\* in whole numbers, 60:30:20:15:12:10

\textsuperscript{211} Snyder, 59-61.  
\textsuperscript{212} Ibid., 61, 62.  
\textsuperscript{213} Ibid., 62.  
\textsuperscript{214} Ibid.  
\textsuperscript{215} Ibid.  
\textsuperscript{216} Ibid., 63.  
\textsuperscript{217} Ibid.  
\textsuperscript{218} Ibid.
Rejecting the double-generator theory, Shirlaw views the minor triad as the inversion of the major triad.\textsuperscript{220} Major triads consist of the same intervals as minor triads.\textsuperscript{221} The distinction between the two is the placement of the interval of the third.\textsuperscript{222} Consequently, the minor triad is not constructed upward from the root as it is with the major triad, but it is constructed downward from the fifth, which becomes the fundamental pitch of the minor triad.\textsuperscript{223} Shirlaw explains:

Dismissing for the moment ratios and proportions, we may at first concentrate on a certain distinguishing feature of the minor harmony about which probably the majority of musicians are agreed. It is this, that while in the major harmony the tonal weight seems to gravitate towards and centre in the fundamental note, in the minor harmony, which is allowed to retain some at least of its original purity, and is not approximated to what we may call its tonic major harmony, the sound that impresses the ear as of quite peculiar importance is not the reputed fundamental note but the fifth: i.e., in the minor harmony a-c-e, not a, but e.\textsuperscript{224}

\footnotesize
\begin{itemize}
  \item \textsuperscript{219} Snyder, 63.
  \item \textsuperscript{220} Ibid., 63, 64.
  \item \textsuperscript{221} Ibid., 63.
  \item \textsuperscript{222} Ibid., 62-64.
  \item \textsuperscript{223} Ibid., 64.
  \item \textsuperscript{224} Ibid.
\end{itemize}
Shirlaw referred to the third as the *dominant*, the root as the *mediant*, and the fifth as the *final* in the A minor triad.225 According to Shirlaw, the minor triad in its most authentic form is a second inversion triad constructed downward from the final, or fifth of the chord.226 The A minor triad, for instance, would be spelled “e-c-a-e”.

In the article, *The Fallacy of Harmonic Dualism*, Otto Ortmann referred to historical application in order to disprove prior theories.228 He insisted that if the minor triad were a function of the downward construction of the major triad, then a harmonic system based on that model would exist; because there is no such system, Ortmann argued that harmonic dualism is a fallacy.229 Further, he referenced the fact that the major triad is historically viewed as more important than the minor triad; this can be seen in the use of the Picardy third, which exists in minor mode and not in major mode.230

Ortmann also attacked the undertone series by arguing that the amount of dissonance is greater in the undertone series than in the overtone series, as is demonstrated by playing both at the piano.231 He goes on to argue that, according to his research, textbooks always address the major scale before the minor scale.232 Finally, he asserts that music students learn major scales before learning minor scales, however, he has no evidence to corroborate this fact.233

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225 Snyder, 65.
226 Ibid., 64, 65.
227 Ibid., 65.
228 Ibid., 70-72.
229 Ibid., 70.
230 Ibid., 70, 71.
231 Ibid., 71.
232 Ibid.
233 Ibid.
Ortmann proposed two theories in substitution of the undertone theory.\textsuperscript{234} His first theory was harmonic; he introduced the idea that the essential harmonic relationships for a given pitch are a fifth below, and a third above and below that pitch.\textsuperscript{235} Example 12 shows a number of tonal relationships to the C minor triad.\textsuperscript{236} The black notes represent what is heard from the pitches of the C minor triad, the half-colored notes represent the more supplementary tones which produce aural “after images”, and the white notes represent the pitches produced solely in the ear.\textsuperscript{237} Ortmann concludes that number 2 has the closest connection to the sounding triad; consequently, he surmises, “the true root of a minor triad is a major third below the given root.”\textsuperscript{238}

Example 12: Ortmann, Harmonic Model\textsuperscript{239}

The second theory proposed by Ortmann is melodic.\textsuperscript{240} In the melodic model, the primary function relates to movement by semitone, while the secondary function relates to movement by whole tone.\textsuperscript{241} Example 13 reveals the C major triad to be the option

\begin{itemize}
\item \textsuperscript{234} Snyder, 72.
\item \textsuperscript{235} Ibid.
\item \textsuperscript{236} Ibid.
\item \textsuperscript{237} Ibid.
\item \textsuperscript{238} Ibid., 72, 73.
\item \textsuperscript{239} Ibid., 72.
\item \textsuperscript{240} Ibid., 72, 73.
\item \textsuperscript{241} Ibid., 73.
\end{itemize}
with the least amount of pitch movement.\textsuperscript{242} Consequently, in melodic terms, Ortmann considered the major triad to have the closest relationship to its parallel minor.\textsuperscript{243}

![Example 13: Ortmann, Melodic model\textsuperscript{244}](image)

Example 13: Ortmann, Melodic model\textsuperscript{244}

Ortmann’s theories suffer from similar problems as those proposed by Riemann; while providing an alternate version of harmonic dualism, he offers no corroborating evidence to support it.\textsuperscript{245} Ortmann lacks support for the existence of aural “after images”.\textsuperscript{246} He also provides no support for pitches that are produced solely in the ear.\textsuperscript{247}

The principles of inversion embraced by many harmonic dualists served as a precursor to neo-Riemannian theory.\textsuperscript{248} Theorist David Lewin, by means of inversion, developed a technique that allowed him to connect major triads to minor triads.\textsuperscript{249} In doing so, he was able to transform a major triad to its parallel minor and a minor triad to its parallel major.\textsuperscript{250} He was also able to use this transformational technique to connect triads to their relative major or minor.\textsuperscript{251}

\textsuperscript{242} Snyder, 73.
\textsuperscript{243} Ibid.
\textsuperscript{244} Ibid.
\textsuperscript{245} Ibid., 73, 74.
\textsuperscript{246} Ibid., 73.
\textsuperscript{247} Ibid.
\textsuperscript{249} Ibid.
\textsuperscript{250} Cohn, Introduction to Neo-Riemannian Theory, 170.
\textsuperscript{251} Ibid.
CHAPTER 4
NEO-RIEMANNIAN THEORY

The highly chromatic, yet tonal music that was composed during the mid-nineteenth-century and beyond, presented a problem for musical analysis.\(^{252}\) Thus, Neo-Riemannian theory was conceived as a means to explain the music of composers such as Wagner and Liszt; this music was rooted in traditional harmonic formation as well as traditional cadences, but could not be analyzed as such.\(^{253}\) Essentially, this music used traditional harmony, while breaking away from traditional tonality.\(^{254}\) According to Richard Cohn:

\[
\text{The neo-Riemannian response recuperates a number of concepts cultivated, often in isolation of each other, by individual nineteenth-century harmonic theorists. The following exposition identifies six such concepts: triadic transformations, common-tone maximization, voice-leading parsimony, “mirror” or “dual” inversion, enharmonic equivalence, and the “Table of Tonal Relations.” With few exceptions, nineteenth-century theorists incorporated each of these concepts into a framework governed by some combination of diatonic tonality, harmonic function, and dualism.}^{255}\]

The earliest stages of neo-Riemannian theory can be found in Lewin’s essay, *A Formal Theory of Generalized Tonal Functions.*\(^{256}\) In his commentary, Lewin discusses two types of triadic transformations; the first type of transformation connects major triads to minor triads using triadic inversion.\(^{257}\) The second type of transformation is shown in Example 14, where Lewin alternates major and minor triads a third apart.\(^{258}\) These triads

\(^{252}\) Cohn, Introduction to Neo-Riemannian Theory, 167, 168.
\(^{253}\) Ibid.
\(^{254}\) Ibid., 169.
\(^{255}\) Ibid.
\(^{256}\) Ibid., 170.
\(^{257}\) Ibid.
\(^{258}\) Ibid., 170, 171.
are connected by common tones, where each triad shares two common tones with the one preceding it.\(^{259}\)

\[
\text{bb Db f Ab c Eb g Bb d F a C e G b D f# A c# E g# B d#}
\]

Example 14: Lewin, Second Transformation\(^ {260}\)

Lewin eventually redefined these transformations as REL, PAR, and LT.\(^ {261}\) REL was defined as an operation that transforms a triad to its relative major or minor.\(^ {262}\) PAR was defined as an operation that transforms a triad to its parallel major or minor; LT was defined as an operation that transforms a triad to another triad a major third or minor sixth apart.\(^ {263}\) The DOM transformation takes one triad to another triad by means of transposition.\(^ {264}\)

Brian Hyer advanced David Lewin’s ideas in 1989.\(^ {265}\) He adopted the nineteenth-century graph, known as the *Table of Tonal Relations*, or *Tonnetz*, shown in Example 15.\(^ {266}\) In the Tonnetz, each triangle represents a major or minor triad; R, P, and L represent REL, PAR, and LT respectively.\(^ {267}\) The D represents the dominant.\(^ {268}\) Hyer’s Tonnetz ultimately expands upon, and amplifies Lewin’s proposal demonstrated in Example 14.\(^ {269}\)

\(^{259}\) Cohn, Introduction to Neo-Riemannian Theory, 170, 171.
\(^{260}\) Ibid., 171.
\(^{261}\) Ibid., 170, 171.
\(^{262}\) Ibid., 171.
\(^{263}\) Ibid.
\(^{264}\) Ibid., 170, 171.
\(^{265}\) Ibid., 171.
\(^{266}\) Ibid., 171, 172.
\(^{267}\) Ibid.
\(^{268}\) Ibid., 172.
\(^{269}\) Ibid., 171, 172.
Theorist Edward Gollin calls attention to certain relevant features of the Tonnetz. In *Some Aspects of Three-Dimensional 'Tonnetze',* Gollin notes that all pitches are structured on the Tonnetz by the interval of a perfect fifth along a given axis and a major third along the other axis. He also states that each triangle can be associated with a triad, whose pitches connect to form two essential axes. Additionally, he identifies a connection between major and minor triads, which are diametrically positioned on the Tonnetz. Finally, Gollin notes that adjacent triads on the Tonnetz "share two common tones if they share a common edge", while they have "one common tone if they share a common vertex".

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270 Cohn, Introduction to Neo-Riemannian Theory, 172.
272 Ibid., 196.
An analysis by Lewin provides practical context for the neo-Riemannian operations. Example 16 shows two harmonic reductions from the music of Wagner.

Example 16: Lewin Analysis, Wagner, *Tarnhelm* and *Valhalla* Motive

The *Tarnhelm* motive in Example 16(a), displays the G# minor triad moving to an E minor chord, before concluding with the ambiguous B-F interval. Example 16(b) shows the *Valhalla* motive is equivalent to the *Tarnhelm* motive through the transformation of inversion. The third triad in Examples 16(a) and (b) involve movement by fifth. Example 16(c) shows the consistency of the dualistic labels regardless of the register in which they occur; Example 16(d) diagrams the operations.

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273 Tymoczko, Dualism and the Beholder’s Eye, 256, 257.
274 Ibid., 257.
275 Ibid., 256, 257.
276 Ibid.
277 Ibid.
278 Ibid., 257.
used to transform each triad using dualistic terms. The “S” refers to “subdominant”, meaning upward movement by fifth. Lewin labels the first progression in Example 16(a) and (b) as “LP”, meaning both the “L” and “P” operations were used to transform the G♯ minor chord to the E minor chord and the G ♭ major chord to the B ♭ major chord. While there is no evidence for the use of inversional symmetry in conventional harmonic practice, these terms are helpful in understanding the chromatic relationships of music created in the nineteenth century. Also, although the Tarnhelm and Valhalla chord progressions are related by inversion, it is worth noting that they both use parsimonious voice leading.

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279 Tymoczko, Dualism and the Beholder’s Eye, 257.
280 Ibid.
281 Ibid.
282 Ibid., 252, 253.
283 Ibid., 258.
CHAPTER 5
PARSIMONIOUS VOICE LEADING

Parsimonious voice leading is the movement of one triad to another through the preservation of two common tones, and moving one tone by either half step or whole step. While eighteenth-century composers based harmonic progressions on root movement, and by fifth relation, many nineteenth-century composers found a connection between triads based on shared common tones and half-step voice leading. Richard Cohn considers triads that progress by means of voice parsimony to be maximally smooth. Cohn also examines Brahms’ Concerto for Violin and Cello, first movement, mm. 268-279 in order to generate the harmonic reduction shown in Example 17.

Example 17: Reduction, Brahms, Concerto for Violin and Cello, I, mm. 268-279

The triads represented are assigned a “+” if it is a major triad and a “−” if it is a minor triad. From the harmonic reduction, Cohn concludes that the maximally smooth triads

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285 Cohn, Introduction to Neo-Riemannian Theory, 174.
287 Ibid., 14, 15.
288 Ibid., 15.
shown in the example create cycles.290 These cycles are defined as “an ordered set of at least four elements whose initial and terminal elements are identical and whose other elements are distinct.”291 These cycles also consist of six major and minor triads and can be organized into four hexatonic systems that include all twenty-four major and minor triads.292

![Diagram of hexatonic systems]

Example 18: Cohn, The Four Hexatonic Systems293

The four hexatonic systems are shown in Example 18.294 When referring to the graphic in Example 18, the term interval is used, not to indicate the distance between two pitches,

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289 Cohn, Maximally Smooth Cycles, 13.
290 Ibid., 15.
291 Ibid.
292 Ibid., 15-18.
293 Ibid., 17.
294 Ibid., 17, 18.
but to represent the distance between two triads represented within a given hexatonic system. Consequently, the interval between C major C minor is 1, and moves parsimoniously, retaining two common tones. Two triads that are separated by an interval of 3 create a hexatonic pole. Understanding how these hexatonic poles function is useful in understanding certain nineteenth-century harmonic relationships.

When dealing with hexatonic systems, the term transposition is used to refer to the intervallic distance between triads. Consequently, T₁ is the distance between a C major triad and a C minor triad, where T stands for transposition and the subscript is the number of intervals between triads. Using T₂, T₃, and T₄ operations, co-cycles are produced. Example 19 shows two T₂ co-cycles.

Example 19: Co-Cycles, T₂

295 Cohn, Maximally Smooth Cycles, 18.
296 Ibid., 18, 19.
297 Ibid., 19.
298 Ibid., 18-23.
299 Ibid., 19.
300 Ibid., 19, 20.
301 Ibid., 20.
302 Ibid.
303 Ibid.
As the example shows, $T_2$ co-cycles produce triads of the same quality; interestingly, $T_4$ co-cycles produce $T_2$ co-cycles in retrograde form. There are a substantial number of these co-cycles in the music of nineteenth-century composers, most likely because they could do so without changing chord quality. Example 20 shows three $T_3$ co-cycles.

\[ \text{Example 20: Co-Cycles, } T_3 \]

The co-cycles in Example 20 create hexatonic poles; the triads that make up these hexatonic poles consist of a great deal of symmetry. Also, both of these triads possess the lowered sixth and the raised seventh of the other triad. This produces chromatic relationships that are in direct opposition to diatonic harmony. As a result, composers often used these hexatonic poles in order to evoke a mood of spirituality or otherworldliness. Example 21, for instance, shows the harmonic progression that Wagner used to portray the separation of the soul from the body in Act III of Parsifal.

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304 Cohn, Maximally Smooth Cycles, 20.
305 Ibid.
306 Ibid., 21.
307 Ibid.
308 Ibid., 20, 21.
309 Ibid., 21.
310 Ibid., 20.
311 Ibid., 21.
312 Ibid.
Consequently, analyzing the function of late nineteenth-century chromaticism becomes much easier when expressed through Riemannian concepts and "dualistic terminology". Concerning the gradually increasing application of parsimonious voice leading in nineteenth-century music, Dmitri Tymoczko says:

Let me approach these issues by proposing a very simple model of late-nineteenth-century tonality, according to which the music combines a diatonic "first practice" inherited from eighteenth-century tonality with a chromatic "second practice" emphasizing efficient voice leading between familiar sonorities. This flexible "second practice" sets very few constraints on composers: virtually any voice leading between familiar chords may be used, as long as it is efficient. These chromatic voice leadings serve a variety of musical functions, acting as neighboring chords, passing chords, intensifications of dominants, modulatory shortcuts between distant keys, and so on.

He continues to explain, "Over the course of the century, one finds a gradual emancipation of the second practice, as chromatic voice leading—at first sporadic and decorative—controls ever-larger stretches of music."

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313 Cohn, Maximally Smooth Cycles, 21.
314 Tymoczko, Dualism and the Beholder’s Eye, 252, 253.
315 Ibid., 253.
316 Ibid.
CHAPTER 6
PARSIMONIOUS VOICE LEADING WITH SEVENTH CHORDS

Although Neo-Riemannian harmonic transformations have focused primarily on triads, voice-parsimony was also applied to seventh chords in nineteenth-century music. In the article, *Moving Beyond Neo-Riemannian Triads: Exploring a Transformational Model for Seventh Chords*, Adrian P. Childs examines passages from nineteenth-century music, such as the music dramas of Richard Wagner, in order to gain a perspective on parsimonious voice leading as they applied it to seventh chords. Childs analyzes the seventh chords in a passage from the “Agony” aria in *Parsifal* by harmonically reducing the seventh chords to triads. His simplification method involves the removal of the seventh of the dominant seventh chords and the root of the half-diminished seventh chords.

Example 22: Harmonic Reduction, Wagner, *Parsifal*, mm. 1369-70

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318 Ibid., 181-93.
319 Ibid., 182.
320 Ibid.
321 Ibid., 183.
The harmonic reduction in Example 22 displays the triadic movement in the opening measures of the aria; the F major triad and D♭ minor triads create hexatonic poles. Similarly, the E♭ major and C♭ minor triads create hexatonic poles. As Adrian Childs explains:

This brief analysis fails to account, however, for the descending thirds of the upper voices and the stepwise descent in the “tenor” voice. That these two elements exhibit strikingly smooth voice leading, a feature generally associated with neo-Riemannian transformations, suggests that something is being lost with the simplification of seventh chords into triads.

Another example of neo-Riemannian transformations can be found in *Prelude in C# Minor*, op. 45 by Chopin. In the cadenza, the harmonic reduction shown in Example 23 reveals two R transformations from A major to F♯ minor and G♯ major to F minor.

![Example 23: Harmonic Reduction, Chopin, cadenza](image)

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322 Childs, 182.
323 Ibid.
324 Ibid.
325 Ibid.
326 Ibid., 182-84.
327 Ibid., 184.
Ignoring the G♮ in the first chord and the D# in the second chord, the harmonies can be examined as triads. Typically in an R transformation from A major to F# minor, the E will move to F# and the F# minor triad will retain the A and C# from the previous triad. However, in this instance, the E moves to D# and the G♮ moves to F#; the parsimonious voice leading in this passage involves non-triadic tones. Consequently, there is a strong indication that neo-Riemannian transformations may be applied to seventh chords.

Applying neo-Riemannian transformations to seventh chords requires the parsimonious voice movement of two voices and the retention of two voices. This can be accomplished with dominant and half-diminished seventh chords. Also, any dominant or half-diminished seventh chord can be reached through voice parsimony from a fully diminished seventh chord. Example 24 shows the transformation of a fully diminished seventh chord by using parsimonious voice leading. Moving the F# to F♮ forms an F dominant seventh chord. By returning the F♮ to F# and moving the C by one semitone to B, the B dominant seventh chord is formed.

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328 Childs, 182.
329 Ibid.
330 Ibid.
331 Ibid.
332 Ibid., 184.
333 Ibid., 182-84.
334 Ibid., 184.
335 Ibid., 185.
336 Ibid., 184, 185.
337 Ibid.
Example 24: Parsimonious Voice Leading, Seventh Chords

The method of parsimonious voice leading shown in Example 24 is the foundation of an entire system of transformations for seventh chords; these seventh chords are transformed by means of $S$ transforms or $C$ transforms. The $S$ transforms consist of moving two pitches in similar motion by semitone, while retaining two pitches. The $C$ transforms consist of moving two pitches in contrary motion by semitone, while retaining two pitches. Each transformation type, $S$ and $C$ are followed by a subscript, which represents the interval class between the pitches that have been retained from the previous chord; the first subscript is followed by a second subscript in parentheses, which represents the interval class between the pitches that move by semitone.

Example 25 displays dominant and half-diminished seventh chord transformations by means of $C$ and $S$ transforms. In the example, a “+” refers to dominant seventh chords, while a “-” refers to half-diminished seventh chords; notes that are filled-in have moved, and notes that are retained from the previous chord are open.

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338 Childs, 185.
339 Ibid.
340 Ibid.
341 Ibid.
342 Ibid.
343 Ibid., 185, 186.
344 Ibid., 186.
Example 25: Dominant and Half-Diminished Seventh Chord Transformations

Returning to the previous example of Wagner’s Parsifal, it becomes apparent from Example 26, that this progression is better analyzed as a series of S transforms. The hexatonic poles from the original reduction are now analyzed as triple transforms, providing a more adequate explanation for the fluid voice parsimony in this section.

Example 26: New Harmonic Analysis of Parsifal

Similarly, Example 27 shows an alternate analysis of Prelude in C# Minor, op. 45 by Chopin.

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345 Childs, 186.  
346 Ibid., 189, 190.  
347 Ibid., 189.  
348 Ibid., 190.  
349 Ibid., 189, 190.
Again, the fluid movement of alternating dominant and half-diminished seventh chords allows for a better harmonic understanding of the passage. Adrian Childs demonstrated that neo-Riemannian transformations could be applied through parsimonious voice leading to seventh chords. Specifically, it was shown how these techniques could be applied to dominant and half-diminished seventh chords. Because of specific traits common to major triads, minor triads, and certain seventh chords, similar voice parsimony techniques can be applied to any chords of these types. More definitively, these traits refer to "near-symmetries" as described by Dmitri Tymoczko.

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350 Childs, 190.
351 Ibid., 189, 190.
352 Ibid., 181-91.
353 Ibid.
354 Ibid.
PART IV
THE PENTACHORD TECHNIQUE

CHAPTER 7
PARSIMONIOUS VOICE LEADING WITH EXTENDED HARMONIES

Introduction and Background

Several earlier examples have demonstrated how neo-Riemannian techniques have been used to connect triads to triads, and seventh chords to seventh chords. Is it possible, however, using similar techniques, to proceed beyond seventh chords and apply parsimonious voice leading to extended harmonies? In James McGowan’s essay, *Riemann’s Functional Framework for Extended Jazz Harmony*, he takes a different approach to seventh chord analysis by examining jazz harmony. McGowan’s approach, however, deals primarily with harmony as it relates to tonal jazz progressions, focusing heavily on dominant to tonic relationships and traditional musical phrasing. Sara Briginshaw’s 2012 essay, *A Neo-Riemannian Approach to Jazz Analysis*, draws attention to the limitations of Gollin’s three-dimensional seventh-chord Tonnetz stating the following:

The three-dimensional model is limiting in that it does not accommodate near-transformations. For example, the two moving voices must move by semitone; if one travels by semitone and the other by whole tone, the entire system is rendered ineffective. Voice leading by whole tone often occurs in jazz and using only Gollin’s system to analyze seventh chords would severely limit its potential in the analysis of the genre as a whole.

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357 Ibid.
In her essay, Briginshaw presents a hexagonal lattice, shown in Example 28, with each hexagon representing one of the twelve chromatic pitches. The primary objective of the hexagonal lattice is to provide better spatial representation than Hyer’s Tonnetz (see Example 15). Interestingly, the information represented on the Tonnetz is identical to what is shown on the hexagonal lattice. In this instance, however, the pitches on the lattice are spatially structured to adequately serve seventh chord analysis.

Example 28: Briginshaw, Hexagonal Lattice

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359 Briginshaw, 74, 75.
360 Ibid.
362 Briginshaw, 74-78.
363 Ibid., 75.
The harmonic progression in the first two measures of George Gershwin’s *A Foggy Day*, in Example 29(a) and 29(b), shows how these seventh chords are spatially represented on Briginshaw’s hexagonal lattice.\(^{364}\)

Example 29(a): Gershwin, *A Foggy Day*, mm. 1, 2\(^{365}\)

Example 29(b): Gershwin, Hexagonal Lattice, *A Foggy Day*, mm. 1, 2\(^{366}\)

\(^{364}\) Briginshaw, 77, 78.
\(^{365}\) Ibid., 78.
Example 29(b) visually shows the retention of pitches A and C for all three chords.\textsuperscript{367}

Additionally, the seventh on each of the chords, the flat fifth on the second chord in the progression, and the flat ninth on the final chord in the progression is not spatially displayed as well on Hyer’s Tonnetz.\textsuperscript{368}

Briginshaw based her hexagonal lattice on a lattice presented by Louis Bigo, Antoine Spicher, and Olivier Michel in their essay, \textit{Spatial Programming for Music Representation and Analysis} (see Example 30), which presents an adequate model for the analysis of triads.\textsuperscript{369}

![Hexagonal Lattice Diagram](image)

**Example 30:** Bigo, Spicher, and Michel, Hexagonal Lattice\textsuperscript{370}

\textsuperscript{366} Briginshaw, 78.
\textsuperscript{367} Ibid., 77, 78.
\textsuperscript{368} Ibid.
\textsuperscript{370} Ibid.
In this hexagonal lattice, consonant triads are spatially positioned efficiently. While Briginshaw’s model may present an ideal spatial representation for seventh chord jazz analysis, the hexagonal lattice rendered by Bigo, et al. provides a spatially optimized model for the analysis of parsimonious voice leading with extended chords, as they are defined in this study.

**Harmonic Dualism Applied to Extended Harmonies**

In recent times, complex harmonies often feature prominently in compositional practice; extended harmonies and dense chord clusters have become increasingly popular for composers. A neo-Riemannian approach to analyzing extended harmonies may be helpful in the functional application of these chords in contemporary composition. Harmonic dualism, and parsimonious voice leading may be of particular interest in this context.

Having already defined and discussed chord symmetry in Chapter 3, it may be appropriate to examine some examples of symmetry as it can be applied to extended harmonies. The dominant ninth chord is a symmetrical chord under the transformation of inversion. Dualistically speaking, if the C\(^9\) chord is constructed downward from the root, as shown in Example 31, the chord quality is consistent, although the root changes. If the C\(^9\) chord is constructed downward from the ninth, both the root and chord quality remain constant.

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371 Bigo, Spicher, and Michel, 3, 4.  
372 Cope, xi.  
373 Tymoczko, Dualism and the Beholder’s Eye, 251.
Example 31: Downward Construction of Dominant Ninth Chord

Regardless of the selected pitch from which these chords are constructed, the intervallic relationships are preserved. The major ninth chord, however, does not preserve its intervallic relationships through the transformation of inversion. Example 32 shows the CMaj$^9$ chord and two transformations. The downward construction from the root produces the $B^bm^9$ chord, while the downward construction from the ninth of the chord produces the Cm$^9$ chord. Consequently, the inversion of the major ninth chord results in a change in chord quality.

Example 32: Downward Construction of Major Ninth Chord
Parsimonious Voice Leading Applied to Pentachords

For the purpose of this dissertation, pentachords are defined as consonant triads with the added seventh (major or minor) and one tertian extended tone. The minor eleventh chord will be used in order to avoid the dissonant interval of the minor second created with the major third and the eleventh. Further, in keeping with the definition of triadic transformations proposed by Lewin in 1987, pentachords will be mapped only to pentachords.\(^{374}\) Also, it is important to note that the word "transformation", as it is used here, should not be confused with its application in transformational theory where Lewin applies a system of operations to objects within a closed space.\(^{375}\)

In order to map pentachords to each other through parsimonious voice leading, it is important to be aware of certain patterns and designs in the array of pitches, not only among extended chord families of identical harmonic quality, but among all pentachord types. For example, parsimonious voice leading using only ninth chords has a limited number of transformations that will fit the criteria of a pentachord, as defined here. A CMaj\(^9\) pentachord (C-E-G-B-D) will only map to a C\(^9\) pentachord (C-E-G-B♭-D), which in turn will map to a Cm\(^9\) pentachord (C-E♭-G-B♭-D). Consequently, it becomes beneficial to explore parsimonious operations as they affect a number of different pentachord types.

It is not feasible to exhaust all possible options of parsimonious transformations on pentachords in this context. There are, however, voice leading patterns that form chains of pentachords that could create a strong foundation for a contemporary

\(^{374}\) Cohn, Introduction to Neo-Riemannian Theory, 170, 171.
composition. Example 33 shows how a CMaj[^9] pentachord can be mapped to a BMaj[^9] pentachord by means of parsimonious voice leading, with four pitches preserved, moving to each adjacent chord, and the other pitch moving by one semitone.

Example 33: Non-Circular Parsimonious Voice Leading, Pentachords

Because the initial chord on the chart is different than its final chord, this system does not fit Richard Cohn’s strict definition of a cycle.[^376] Additionally, it should be pointed out that this system is not a closed system. That is, many of these pentachords can be mapped to alternate pentachords not shown on the chart. With this understanding, it becomes useful to examine the possibilities for moving parsimoniously from one pentachord to another pentachord. Isolating three types of pentachords, the following voice leading options have been determined:

- Starting with a 9th chord, there are 5 possible options
- Starting with a minor 11th chord, there are 4 possible options
- Starting with a 13th chord, there are 3 possible options

[^376]: Cohn, Maximally Smooth Cycles, 15.
These options are shown graphically in Example 34. In the example, the variables x, y, and z are used to represent *pitch class* numbers. Pitch class is defined in post tonal terms as positive integers ranging from 0 to 11, which are associated with each of the 12 chromatic pitches. In pitch class notation, the pitch C is equal to the pitch class number 0, the pitch C# is equal to the pitch class number 1, the pitch D is equal to the pitch class number 2, and continuing to pitch B, which is equal to pitch class number 11. The variables in the example form "cells", which represent the possible pentachords that can be reached from ninth chords, minor eleventh chords, and major thirteenth chords by parsimonious voice leading.

By assigning pitch class numbers to the variables in the cells shown in Example 34, relationships between pentachords begin to emerge. For instance, if x = 4 in Example 34(a), then the diagram shows the parsimonious connection between the E⁹ chord and the following pentachords: Em⁹, EMaj⁹, GMaj¹³, C#m¹¹, and Bm¹¹. This process works for any integer that is associated with a pitch class number. The same method can also be applied to Examples 34(b) and 34(c). It should be noted that the minor ninth chord and major thirteenth chord share the same five pitches even though they are shown as distinct chords in Examples 34(a) and 34(c).

Example 35 shows the realization of chords on the diagram when assigned numeric pitch class values. Specifically, in Example 35(a), the variable x was given a value of 11. The variable y in Example 35(b) was given a value of 1. Finally, the variable z in Example 35(c) was given a value of 2. The function of the chords in each diagram is

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378 Ibid.
limited to the relationship between the "central chord" and the "surrounding chords". The surrounding chords are not directly related to each other through voice parsimony.

(a) \[(x - 3) m^{11}\]
\[(x + 3) \text{ Maj}^{13}\]
\[x^{9}\]
\[(x + 7) m^{11}\]
\[x m^{9}\]
\[x \text{ Maj}^{9}\]

(b) \[(y + 5)^{9}\]
\[(y + 7) m^{11}\]
\[y m^{11}\]
\[(y + 5) m^{11}\]
\[(y + 3)^{9}\]

(c) \[z \text{ Maj}^{13}\]
\[z m^{13}\]
\[z^{13}\]
\[(z - 3) m^{9}\]

Example 34: Cells, Variables Representing Pitch Class Numbers, Pentachords
Example 35: Cells, Pitch Notation, Pentachords
These cells can be useful in visually displaying the relationships between pentachords using parsimonious voice leading. Example 35(b) shows a perfect fourth relationship between minor eleventh pentachords. Consequently, a cycle of twelve minor eleventh pentachords can be formed using parsimonious voice leading as shown in Example 36.

Example 36: Cycle of Fourths Through Parsimonious Voice leading, Pentachords

Because there is no way to map ninth chords to each other while retaining four common tones using this method, one cycle can be created using all twelve pentachords in the minor eleventh cycle. However, an examination of the connection of pentachords in Example 35(b) reveals a relationship between ninth chords and minor eleventh chords. Therefore, all twenty-four chords of alternating ninth chords and minor eleventh chords can be used to obtain two closed, unrelated cycles of alternating thirds and fifths. By this method of movement, minor eleventh chords can be approached by ninth chords, and
ninth chords can be approached by minor eleventh chords. The two cycles of alternating thirds and fifths are shown in Example 37.

Example 37: Cycles of Alternate Thirds and Fifths, Pentachords

These cycles of thirds and fifths possess the dualistic quality of alternating major and minor harmonies. However, they are lacking the inclusion of the cycle of fourths shown in Example 36.

Consequently, from the cycle of alternating thirds and fifths, a partial chain can be created as shown in Example 38. The chain reveals the relationship between ninth chords and minor eleventh chords by parsimonious voice leading. It also shows how minor eleventh chords are related to each other. Again, because ninth chords cannot be mapped to other ninth chords in this context, there is no connection shown on the chain. It should also be noted that of the two chord types, only ninth chords, as constructed here, possess true symmetry.

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379 Cohn, Introduction to Neo-Riemannian Theory, 170.
Example 38: Chain of Alternating Thirds and Fifths (partial), Pentachords

Example 39 shows the extended version of the chain of alternating thirds and fifths. In the extended version of the chain, all pentachords can be traced through an entire cycle of pentachord transformations in any direction.
Example 39: Complete Chain of Alternating Thirds and Fifths, Pentachords

The mechanism used to transform these pentachords is related to parsimonious movement of roots, thirds, fifths, and sevenths. Minor eleventh chords are mapped to each other by the exchange of thirds and fifths. Specifically, the fifth of a minor eleventh chord becomes the third of the resultant chord if moving by root in perfect fourths. When moving in the opposite direction, the third of the minor eleventh chord becomes the fifth of the resultant chord. Table 1 shows a typical transformation of one minor eleventh chord to another minor eleventh chord by parsimonious voice leading.
Table 1: Pentachord Voice Leading, Minor Eleventh Chords

<table>
<thead>
<tr>
<th></th>
<th>F#m(^{11}) Chord</th>
<th>Bm(^{11}) Chord</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eleventh</td>
<td>B</td>
<td>E</td>
</tr>
<tr>
<td>Seventh</td>
<td>E</td>
<td>A</td>
</tr>
<tr>
<td>Fifth</td>
<td>C#</td>
<td>F#</td>
</tr>
<tr>
<td>Third</td>
<td>A</td>
<td>D</td>
</tr>
<tr>
<td>Root</td>
<td>F#</td>
<td>B</td>
</tr>
</tbody>
</table>

In the case of alternating pentachords, and taking into account all directions on the chain shown in Example 39, there are four types of transformations. First, minor eleventh chords are transformed to ninth chords if their roots are a minor third apart. In these instances, the root of the minor eleventh chord becomes the seventh of the ninth chord. In the second type of transformation, ninth chords are transformed to minor eleventh chords if their roots are a perfect fifth apart. During these transformations, the third of the ninth chord becomes the seventh of the minor eleventh chord. Table 2 and Table 3 demonstrate transformations of these types of chords.

Table 2: Pentachord Voice Leading, A#m\(^{11}\) Chord to C\(^{9}\) Chord

<table>
<thead>
<tr>
<th></th>
<th>A#m(^{11}) Chord</th>
<th>C(^{9}) Chord</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eleventh</td>
<td>D#</td>
<td>D#</td>
</tr>
<tr>
<td>Seventh</td>
<td>G#</td>
<td>B</td>
</tr>
<tr>
<td>Fifth</td>
<td>F</td>
<td>G#</td>
</tr>
<tr>
<td>Third</td>
<td>C#</td>
<td>F</td>
</tr>
<tr>
<td>Root</td>
<td>A#</td>
<td>C#</td>
</tr>
</tbody>
</table>
Table 3: Pentachord Voice Leading, C#⁹ Chord to G#m¹¹ Chord

<table>
<thead>
<tr>
<th></th>
<th>C#⁹ Chord</th>
<th>G#m¹¹ Chord</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ninth</td>
<td>D#</td>
<td>C#</td>
</tr>
<tr>
<td>Seventh</td>
<td>B</td>
<td>F#</td>
</tr>
<tr>
<td>Fifth</td>
<td>G#</td>
<td>D#</td>
</tr>
<tr>
<td>Third</td>
<td>F</td>
<td>B</td>
</tr>
<tr>
<td>Root</td>
<td>C#</td>
<td>G#</td>
</tr>
</tbody>
</table>

In the third type of transformation (moving in the opposite direction of the transformation shown in Table 2), ninth chords become minor eleventh chords if their roots are separated by a major sixth. During these transformations, the seventh of the ninth chord becomes the root of the minor eleventh chord. Table 4 shows an example of this type of transformation.

Table 4: Pentachord Voice Leading, D⁹ Chord to Bm¹¹ Chord

<table>
<thead>
<tr>
<th></th>
<th>D⁹ Chord</th>
<th>Bm¹¹ Chord</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ninth</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Seventh</td>
<td>C</td>
<td>A</td>
</tr>
<tr>
<td>Fifth</td>
<td>A</td>
<td>F#</td>
</tr>
<tr>
<td>Third</td>
<td>F#</td>
<td>D</td>
</tr>
<tr>
<td>Root</td>
<td>D</td>
<td>B</td>
</tr>
</tbody>
</table>

The fourth type of transformation (moving in the opposite direction of the transformation shown in Table 3) involves moving parsimoniously from a minor eleventh chord to a ninth chord if their roots are separated by a perfect fourth. In these instances, the seventh
of the minor eleventh chord becomes the third of the ninth chord. Table 4 shows an example of this type of transformation.

Table 5: Pentachord Voice Leading, Em\textsuperscript{11} Chord to A\textsuperscript{9} Chord

<table>
<thead>
<tr>
<th></th>
<th>Em\textsuperscript{11} Chord</th>
<th>A\textsuperscript{9} Chord</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eleventh</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>Seventh</td>
<td>D</td>
<td>G</td>
</tr>
<tr>
<td>Fifth</td>
<td>B</td>
<td>E</td>
</tr>
<tr>
<td>Third</td>
<td>G</td>
<td>C#</td>
</tr>
<tr>
<td>Root</td>
<td>E</td>
<td>A</td>
</tr>
</tbody>
</table>

An examination of the tables presented here shows voice leading parsimony of one pitch by semitone and the retention of four common tones. Depending on the situation, the root, third, fifth, or seventh may move by semitone. It should be noted, however, that the extended tone is always retained and thus, never involved in the actual voice leading process.

If the principles that were applied to seventh chords regarding voice parsimony and double tone retention (see Chapter 6) were applied to pentachords, four hexatonic cycles can be created. The four systems, similar to those created by Richard Cohn, are shown in Example 40.\textsuperscript{380} Each cycle consists of three hexatonic poles related to each other by tritone.\textsuperscript{381} It is important to note that, unlike Cohn’s cycles, each of the systems shown in Example 40 possess a consistency in chord quality.\textsuperscript{382}

\textsuperscript{380} Cohn, Maximally Smooth Cycles, 17.
\textsuperscript{381} Ibid., 19.
\textsuperscript{382} Ibid., 17.
Example 40: Hexatonic Cycles with Pentachords

Returning to the hexagonal lattice produced by Bigo, Spicher, and Michel, transformations between these pentachords can be displayed and analyzed spatially.\(^{383}\) Example 41 demonstrates a graphic side by side comparison of an analysis of Gershwin’s *A Foggy Day*, and the F\(^9\) transformation to the C#m\(^{11}\) pentachord through parsimonious voice leading.\(^{384}\)

\(^{383}\) Bigo, Spicher, and Michel, 3.

\(^{384}\) Briginshaw, 78.
An examination of Example 41(a) shows that the jazz chord progression in Gershwin’s *A Foggy Day* contains a transformation from a seventh chord to an extended chord, something that is not traditionally the case with parsimonious voice leading.\(^{387}\) Also, while the last transformation in Example 41(a) is parsimonious, because the G moves down by semitone to F#, the D is an added tone and therefore breaks the continuity of pitch quantity from one chord to the next. In comparison, the chord transformation in Example 41(b) exhibits voice parsimony and preserves the number of pitches.

\(^{385}\) Briginshaw, 75, 78.
\(^{386}\) Bigo, Spicher, and Michel, 3, 4.
\(^{387}\) Ibid.
It should be noted that although there are obvious tertian relationships between pitches, Example 41(b) shows that the “nucleus”, or shared consonant triadic tones between these two pentachords is the C# minor triad. Further examination reveals this to be a consistent pattern between ninth chords and minor eleventh chords. The shared triadic tones of the minor eleventh chord and its targeted ninth chord are created from the third, fourth, and fifth of the minor eleventh chord.

Gershwin and Will Donaldson’s *Rialto Ripples* includes an example of an extended chord resolving down by fifth; the score and reduction are shown in Example 42.\(^388\) The D\(^9\) chord in measure 88 moves harmonically to the Gm\(^7\) chord in measure 89.

\[\begin{align*}
\text{(a)} & \\
\text{(b)} & \\
\end{align*}\]

Example 42: Gershwin, Donaldson, *Rialto Ripples*, Score and Reduction, mm. 88, 89\(^389\)

\(^{389}\) Ibid.
The pentachord technique, however, will allow the D\(^9\) chord in measure 20 to move to the Am\(^{11}\) chord with minimal voice leading. By moving the F\# by semitone to G, as shown in Example 43, the D\(^9\) chord becomes the Am\(^{11}\) chord. The Am\(^{11}\) chord can subsequently resolve to the Dm\(^{11}\) chord by moving the E to F.

Example 43: Alternate Harmonies and Voice Leading from D\(^9\) Chord

A comparison of the pentachord technique with Ravel’s *Le Tombeau De Couperin* will demonstrate the difference between two types of harmonic motion using extended tertian harmonies. In the fourth movement, *Rigaudon*, several instances of this type of harmonic motion take place in the opening measures; Example 44 shows the harmonic reduction of mm. 8, 9.\(^{390}\)

Example 44: Ravel, *Le Tombeau De Couperin*, IV, Reduction, mm. 8, 9\(^{391}\)

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\(^{391}\) Ibid.
The measure begins with an Am\(^{11}\) chord, which resolves to an Em\(^7\) chord and subsequently to Gm\(^{11}\) and Am\(^7\) chords. While there is voice parsimony in the exchange of harmonies in measure 8, in which the C in the first chord becomes the B in the second chord, the A drops out altogether. In m. 9, the Gm\(^{11}\) chord resolves to the Am\(^7\) chord. Parsimonious voice leading takes the B\(_b\) to the A and the F to the E, but the D drops out completely. The further reduction in Example 45 more adequately shows the voice leading in these measures.\(^{392}\)

Example 45: Ravel, *Le Tombeau De Couperin*, IV, mm. 8, 9, Voice Leading Reduction\(^{393}\)

Alternatively, the pentachord technique allows for single voice parsimony and the retention of four tones. Example 46 shows the progression of Am\(^{11}\) to C\(^9\) and Gm\(^{11}\) to A\(^{#9}\) through parsimonious voice leading.

Example 46: Pentachord Progression Using Parsimonious Voice Leading


\(^{393}\) Ibid.
The chord progressions shown in Example 48 highlight two distinct features. First, unlike the chord progressions used by Ravel, each progression in Example 46 retains the same number of pitches in each chord. Second, each progression retains four common tones, while moving only one pitch by semitone. The A in the Am\textsuperscript{11} chord moves by half step to B♭ in the first measure to form the C\textsuperscript{9} chord. In the second measure, the Gm\textsuperscript{11} chord is transformed to the A#\textsuperscript{9} chord by semitonal movement of the G to G#. The B♭ in the Gm\textsuperscript{11} chord is enharmonically the A# in the A#\textsuperscript{9} chord. Further, using parsimonious voice leading in this instance allows for an additional connection in this sequence of chords. The C\textsuperscript{9} chord can be connected to the Gm\textsuperscript{11} chord by moving the E in the C\textsuperscript{9} chord to F in the next measure. Consequently, all four chords can be transformed with minimal voice movement. The complete harmonic progression is shown in Example 47.

![Chord Progression Diagram]

Example 47: Pentachord Progression Using Parsimonious Voice Leading, C\textsuperscript{9} to Gm\textsuperscript{11}

Debussy’s Prélude VIII, La Fille aux Cheveux de Lin also includes chord structures relevant to this discussion; the A♭m\textsuperscript{11} in measure 12 resolves to the G♭ major chord in the next measure, as shown in the score and reduction in Example 48.\(^{394}\)

\(^{394}\) Claude Debussy, Prélude Viii La Fille Aux Cheveux de Lin, (Montréal: Les Éditions Outremontaises, 2007), 1.
Example 48: Debussy, *La Fille aux Cheveux de Lin*, Score and Reduction, mm. 12, 13

An examination of the voice leading displayed in Example 48(b) shows the retention of two tones, G♭ and D♭, while moving the A♭ to B♭ and moving the C♭ to D♭. The E♭ drops out during the transition. Using the pentachord technique, there are several options that can be used as target chords from the A♭m₃¹¹ pentachord. Example 49 shows all four options and the voice leading that is used to reach each chord.

In Example 49(a), the A♭m₃¹¹ chord becomes the C♭₉ chord by means of parsimonious voice leading, which makes for a smoother transformation than moving the A♭ to B♭ and the C♭ to D♭, as shown in Example 48(b).

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Example 49: Pentachord Transformations from $A\flat m^{11}$ Chord
Example 49(b) also uses parsimonious voice leading, while additionally exhibiting downward root movement by fifth. Example 49(c) uses voice parsimony as well as root movement by fourth. Finally, Example 49(d) also uses parsimonious voice leading, while exhibiting downward movement by fifth, but unlike Example 49(b), the Abm\textsuperscript{11} chord in this instance transforms to a chord of the same chord quality.

Consequently, the pentachord technique, using parsimonious voice leading, allows for the possibility of chromatic harmonic movement from one pentachord to another, while maintaining the same degree of consonance. Because of the voice parsimony, the vertical stacking of pitches function independently of the chromatic horizontal motion from one chord to the next. The options available allow for the possibilities of parsimonious voice leading and simultaneous root movement by fifth as well as root movement by third.

The pentachord technique consists of two main components. The foundation of the pentachord technique is based on the parsimonious relationships between pentachords. These harmonies do not dominate a composition, but are assimilated into various contexts. While parsimonious voice leading is the first component of the pentachord technique, the second component is based on two types of motives.
CHAPTER 8
STATIC AND DYNAMIC MOTIVES

Leitmotifs, Motives of Reminiscence, and Motives of Presentiments

Musical motive is “the smallest coherent structural unit”. Although the use of motive was not unique to Wagner, he was able to expand the concept far beyond its previous function. The term leitmotif was probably first used by August Wilhelm Ambros in the 1860s. In subsequent decades, Hans von Wolzogen popularized the concept in his essays on the music of Wagner. Wagner made reference to motives of reminiscence and motives of presentiment, the former being the precursor of the leitmotif. Perhaps an often overlooked function of motive is their ability to unify an entire work. Wagner’s use of motives of reminiscence, however, decreased over time indicating an evolution of thought regarding this type of motive. Motives of reminiscence are musical manifestations that act as reminders of things past, while continuing to have an impact on present events. Motives of presentiment are more difficult to define, but these particular motives act as a means of preparation for events that have not been defined by other motives. The many nuances involved in motivic function and motivic variation can sometimes be a complex subject. Consequently, it may

399 Ibid.
401 Ibid., 76, 77.
402 Ibid., 75.
403 Ibid.
404 Ibid., 77.
be helpful to examine some motives as they have been used traditionally and how they compare and contrast with those used in the pentachord technique.

### Static Motives

In describing the similarities between language and musical form, musicologist Lawrence Zbikowski likened aspects of grammar to static forms of music; he also compared the effect of rhetoric to the impact of dynamic forms of music.\(^{405}\) His description of grammar as a rudimentary, or static form of language contrasts his description of rhetoric as structurally more intricate and dynamic.\(^{406}\) Similarly, motives used in the pentachord technique can be either static or dynamic.

Static motives serve as a vital component of the pentachord technique. These motives do not develop. Much like motives of reminiscence, static motives function as reminders of things past. Also similar to Wagner’s motives, static motives act as an agent of unification and synthesis throughout a musical work. Wagner’s motives were built upon musical verse and largely upon repetition.\(^{407}\) Similarly, static motives rely heavily upon repetition.

A static motive is typically presented at the beginning of a work. It must be easily identifiable in order to be recognized on subsequent repetitions. An examination of the *Coriolan Overture* by L.V. Beethoven helps to illustrate how this kind of motive functions within the framework of the pentachord technique.

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\(^{406}\) Ibid., 298.

\(^{407}\) Stein, 76.
Example 50: L.V. Beethoven, *Coriolan Overture*, Reduction, mm. 1-3

The reduction of the motive shown in Example 50 opens the overture. It’s simple, but effectively stated because it is isolated and the dynamic is fortissimo. The motive appears two more times in mm. 4-11 with minimal variations. Examples 51(a) and 51(b) show the motive in later measures.

(a)

(b)

Example 51: L.V. Beethoven, *Coriolan Overture*, Reduction, mm. 5-7, 9-11

Because the harmonies increase in dissonance in each of its first three statements, it could be argued that the motive develops. However, there are several attributes associated with this motive that appear to refute this claim. First, the motive is rhythmically consistent.

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409 Ibid.
410 Ibid.
411 Ibid.
Each occurrence of the motive maintains the identical rhythmic characteristics of the initial statement. Although the quarter note is lengthened to a half note in measure 158, the rhythmic effect is the same. The reduction in Example 52 shows how the motive appears in mm. 276-86.\textsuperscript{412}

\begin{figure}
\centering
\includegraphics[width=0.5\textwidth]{example52}
\caption{Example 52: L.V. Beethoven, \textit{Coriolan Overture}, Reduction, mm. 276-86\textsuperscript{413}}
\end{figure}

Second, the motive is expressed with the same dynamic level of fortissimo each time it occurs. Finally, the orchestration of each occurrence is functionally identical in the opening section and middle section, with the initial notes being performed primarily in the strings and the harmonies composed as brief tutti sections. In the final section, the initial strings are given more support from the woodwinds and the trumpets. It should also be noted that each time the motive occurs, it is presented in the same context. The motive is only heard during a cessation all other musical events.

In summary, the static motive in the pentachord technique never undergoes the typical transformations that are associated with motivic variation. There are no substantial rhythmic alterations. There are no major shifts in orchestration. The motive is never significantly extended or diminished. However, if there are changes in any particular attribute associated with the static motive, there is enough consistency in what has already been presented to render the change functionally ineffectual. Static motives

\textsuperscript{412} Beethoven, \textit{Ouverture to Coriolanus, Op. 62}, 36. \\
\textsuperscript{413} Ibid.
act as a device to bring unity to an entire work; they also function as reminders of things past.

Dynamic Motives

As a general principle, Wagner’s leitmotifs were designed to operate in conjunction with the “poetic verse” of his operas.\textsuperscript{414} On its initial presentation, the leitmotif expresses the emotion of the individual at that time, evolving and developing into the feelings and emotion being expressed later.\textsuperscript{415} In this way, Wagner’s motives connected emotions of the past with those being expressed in the present.\textsuperscript{416} In the pentachord techniques, this is the function of the dynamic, or developing motive.

Much like static motives, dynamic motives help to bring a sense of unity and cohesion to the music in which they operate. Dynamic motives differ from static motives in the sense that they are developed throughout a musical work, much like Schoenberg's Grundgestalt principle (see Chapter 1).\textsuperscript{417} The means by which these motives are developed can include rhythmic changes, harmonic changes, extensions, as well as a number of other alterations. The role of the dynamic motive is to explore the possibilities of the range and degree of emotional expression through motivic expansion and evolution. It is not feasible to examine all of the possibilities of motivic development in this context. Instead, it may be helpful to examine how these motives contrast with the function of static motives.

Debussy’s work for solo piano, \textit{Rêverie}, can be used as an example of how dynamic motives are used in the pentachord technique. It has a strong theme, which is

\begin{footnotesize}
\begin{enumerate}
\item Stein, 76.
\item Ibid., 76, 77.
\item Ibid.
\item Neff, 12.
\end{enumerate}
\end{footnotesize}
stated in mm. 3-6; this complete theme can be reduced to a two-note motive as shown in Example 53.\textsuperscript{418} The motive is presented at the beginning of the larger theme in mm. 3, 4, and again in mm. 5, 6, at the end of the theme. It is similar in length to the motive in Beethoven’s \textit{Coriolan Overture}; it is clearly stated and easily recognizable on subsequent repetitions.

Example 53: Debussy, \textit{R\text{\text{\text{e}}\text{\text{\text{v}}\text{\text{e}}\text{i}}}e} Motive, Reduction, mm. 3, 4\textsuperscript{419}

Debussy repeats the motive in mm. 5, 6. However, in this iteration, he precedes the second note in the motive by a triplet figuration. The motive is repeated once again in mm. 6, 7. In this variation of the motive, Debussy approaches a shortened first note by three quarter notes and transposes the original motive by a whole step, as shown in Example 54.\textsuperscript{420}

Example 54: Debussy, \textit{R\text{\text{\text{e}}\text{\text{\text{e}}\text{\text{\text{v}}\text{\text{e}}\text{i}}}e} Motive, Reduction, mm. 5-8\textsuperscript{421}

In the first eight measures, the motive has already undergone transformations of elongation, figuration, and harmonic alteration. This is different than the motive in

\textsuperscript{418} Claude Debussy, \textit{R\text{\text{\text{e}}\text{\text{\text{v}}\text{\text{e}}\text{i}}}e} (Boston: Ditson, 1914), 261.

\textsuperscript{419} Ibid.

\textsuperscript{420} Ibid.

\textsuperscript{421} Ibid.
Beethoven’s *Coriolan Overture*, which has minimal development throughout the entire work. In measure 19 of *Rêverie*, Debussy transposes the motive by a perfect fourth. He also harmonizes the right hand piano part and alters the dynamics to pianissimo as shown in the reduction in Example 55.\textsuperscript{422}

![Example 55: Debussy, *Rêverie* Motive, Reduction, measure 19](image)

The biggest alterations of the motive in the *Coriolan Overture* take place in mm. 156-58. This can be viewed as a perfect fourth transposition of the motive as stated in mm. 1-3, as well as a change from the F minor chord to a B diminished seventh chord following the initial note. However, this iteration of the motive can also be viewed as a slight shift from the previous iteration, as shown in the reduction in Example 56.\textsuperscript{424}

(a)

![Example 56: L.V. Beethoven, *Coriolan Overture* Motive, Reduction, mm. 152-58](image)

\textsuperscript{422} Debussy, *Rêverie*, 261.

\textsuperscript{423} Ibid.


\textsuperscript{425} Ibid.
The motive depicted in Examples 56(a) and 56(b) undergoes very little change throughout the Coriolan Overture. Conversely, in Rêverie, Debussy constructs several variations of his motive in the first twenty measures alone. Looking further, in mm. 35, 36, the motive appears in the left hand piano part. The first note of the motive is shortened to a quarter note and two eighth notes approach the next note by step, as shown in Example 57.\textsuperscript{426}

\begin{example}
\begin{music}
\setcommand{music-space}{0.85}
\renewcommand{\fractiondivision}{2.5}
\score{\newdefaultlanguage{en}
\newstaff{#1}{0.45}
\newclef{c}\newnote{7/8}
\newmusic{\newcommand{music-flags}{1}}
\newannotation{\newcommand{music-flags}{1}}
\newmusic{p}
\newmusic{pp}
\newnote{2/8}
\newnote{2/8}
\end{music}
\end{example}

Example 57: Debussy, Rêverie Motive, Reduction, mm. 35, 36\textsuperscript{427}

In measure 92, the motive is diminished; repeating quarter notes follow the first quarter note. In mm. 96, 97, shown in the reduction in Example 58, the motive has a similar construction.\textsuperscript{428}

\begin{example}
\begin{music}
\setcommand{music-space}{0.85}
\renewcommand{\fractiondivision}{2.5}
\score{\newdefaultlanguage{en}
\newstaff{#1}{0.45}
\newclef{c}\newnote{7/8}
\newmusic{\newcommand{music-flags}{1}}
\newannotation{\newcommand{music-flags}{1}}
\newmusic{p}
\end{music}
\end{example}

Example 58: Debussy, Rêverie Motive, Reduction, mm. 96, 97\textsuperscript{429}

Debussy continues to develop the motive in mm. 98, 99. The triplet figure of quarter notes in measure 5 is diminished to eighth notes in measure 98, as seen in Example 59.\textsuperscript{430}

\begin{example}
\begin{music}
\setcommand{music-space}{0.85}
\renewcommand{\fractiondivision}{2.5}
\score{\newdefaultlanguage{en}
\newstaff{#1}{0.45}
\newclef{c}\newnote{7/8}
\newmusic{\newcommand{music-flags}{1}}
\newannotation{\newcommand{music-flags}{1}}
\newmusic{p}
\end{music}
\end{example}

Example 59: Debussy, Rêverie Motive, Reduction, mm. 98, 99

\textsuperscript{426} Debussy, Rêverie, 262.  
\textsuperscript{427} Ibid.  
\textsuperscript{428} Ibid., 263.  
\textsuperscript{429} Ibid.  
\textsuperscript{430} Ibid.
Consequently, the static motive serves as an anchor and a foundation for the music. It functions as a reminder of things behind. The dynamic motive explores the possibilities of things ahead. These two motives work together to depict a narrative. The dynamic motive takes the listener on a journey of exploration, transformation, and maturation. The static motive stabilizes the music, creating a sense of nostalgia and sentimentality. The complete story is concluded in the final measures with the static motive remaining largely unchanged, and the dynamic motive evolving into something unexpected.

Example 59: Debussy, *Rêverie* Motive, Reduction, mm. 98, 99

\[ \text{Example 59: Debussy, *Rêverie* Motive, Reduction, mm. 98, 99} \]

431 Debussy, *Rêverie*, 263.
CHAPTER 9
SUMMARY AND CONCLUSIONS

Throughout Western music history, composers have questioned and expanded the norms that prevailed during their lifetime.\(^{432}\) The contemporary composer, however, exists in an environment of conflicting techniques.\(^{433}\) As many successful composers seem to have a general disregard for traditional tonal music, the contemporary composer is placed in unique circumstances.\(^{434}\)

As a result of these circumstances, many composers have pursued methods of composition that allow them to express their music in personal and unique ways.\(^{435}\) Arvo Pärt, for example, was able to abandon the complex language of atonality in favor of the simplicities of the tintinnabuli technique; this technique provided him with the appropriate foundation for his vocal texts.\(^{436}\) In creating micropolyphony, György Ligeti devised a method for incorporating aspects of electronic music into the acoustical environment.\(^{437}\) His method also expanded the possibilities of polyphonic writing.\(^{438}\)

Consequently, it can be advantageous for the contemporary composer to develop a system of techniques that assist in clear and effective communication to an intended audience. The pentachord technique accomplishes this through parsimonious voice leading using extended harmonies and two contrasting types of motives. The pentachord technique has its foundation in harmonic dualism and elements of neo-Riemannian theory. From the core principles of these techniques, the process of pentachordal

\(^{432}\) Cope, xi.
\(^{433}\) Ball, 1, 2.
\(^{434}\) Ehle, 20.
\(^{435}\) Ibid., 22.
\(^{436}\) Muzzo, 29, 30.
\(^{437}\) Bauer, 55.
\(^{438}\) Bernard, Voice Leading, 227.
transformations and chord mappings become possible. The extension of parsimonious voice leading to pentachords provides the basis for a method of harmonic movement that is harmonically contemporary in the vertical sense and heavily chromatic in the horizontal sense.

The voice leading in the pentachord technique allows seventh chords with an extended tertian tone to move to the next chord parsimoniously. The two motives work together to tell a cohesive story through tension and release. The static motive anchors the music to the familiar, while the dynamic motive explores an abundance of options through motivic development. Even though the pentachord technique is just one of many compositional methods existing in music today, its unique qualities can be an asset in establishing a distinct voice in music composition. The extensive use of motive and the expressive harmonies in the pentachord technique can be a great benefit in the endeavor to effectively communicate through music.

While expressive and versatile in many instances, the pentachord technique is limited in its application to solo, non-chordal instruments. The challenge when composing for these instruments involves aspects of implied pentachordal harmony in linear writing. It is also limited in its exclusion of additional extended chords. Further research could examine the possibilities of using thirteenth chords in this technique. Additionally, it could be interesting to explore pentachord voicings and the impact these voicings have on harmonic expression.

Despite these challenges, the pentachord technique is successful as a method of effective musical communication in contemporary Western music culture. It is successful in establishing a clear and unique model of harmonic expression. It is successful in telling
a cohesive narrative through contrasting motives. Finally, it is successful in definitively establishing a distinct compositional voice for the composer.
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VITA

As a composer, Eric Laey has created works for a variety of genres. These include works for orchestra, chamber ensembles, and the visual arts. Originally from Maryland, his interest in music composition eventually led him to North Carolina where he earned a Master of Fine Arts degree in Film Music Composition from the University of North Carolina School of the Arts. Soon after, he earned a Master of Music degree in Composition from the University of North Carolina at Greensboro. He was awarded the Huel D. Perkins Fellowship at Louisiana State University where he expects to receive a Ph.D. in Composition in 2017.